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Gleanings in Bee Culture

Index for 1921

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Index to Gleanings in Bee Culture

Volume XLIX

In using this index the reader should not fail to note that it is divided into five departments, namely, General, Editorial, A. I. Root's writings, Contributors, and Illustrations. The index of General includes everything except Editorials, Illustrations, and A. I. Root's writings.

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HONEY MARKETS

The Government market quotations and the opinions of honey-producers printed below tell of a weaker market and a light demand for honey. All honey-producers will be interested in the reports as to results achieved in some places by seeking a local market. The report from Wisconsin is notable in this regard. There is ground for hope that the market may strengthen after the holidays, for the honey stocks in the hands of jobbers, bottlers, wholesalers and retailers everywhere are light.

U. S. Government Market Reports.

SHIPPING POINT INFORMATION, DEC. 14.

LOS ANGELES, CALIF.—Practically no wire inquiry. Movement poor, market weak, prices lower. Carloads f. o. b. usual terms, per lb., 5- gallon cans white orange and sage 16c, light amber sage 13-15c, light amber alfalfa 10½-15½c, white sweet clover 13c; Hawaiian light amber 9½c. Beeswax: Sacked in l. c. l. lots 40c. Better inquiry is expected after the holidays, altho lower prices are considered possible due to weak sugar market and industrial depression. There is no export demand on account of foreign exchange and present prices of California honey.

INTERMOUNTAIN REGION (COLORADO AND IDAHO).—Light movement of extracted, but more liberal shipments of comb are being made. Carloads f. o. b. usual terms, 24-section cases comb, fancy, $7.00; No. 1, $6.75; No. 2, $6.50 per case.

TELEGRAPHIC REPORTS FROM IMPORTANT MARKETS.

BOSTON.—No arrivals since Dec. 1. Very few sales of comb honey reported and practically none of extracted. Market for comb honey is firm on account of light supplies but unsettled for extracted. Nominal quotations on extracted honey are lower. Comb: Sales to retailers, New York, 24-section cases white clover No. 1, $8.25-9.00; some extra fancy stock selling as high as $12.00 per case; Vermonts, 20-section cases white clover No. 1, $7.50-8.00 per case. Extracted: Nominal quotations to bottlers and confectioners, California, old crop, white sage 18-19c, alfalfa 14-15c per lb.; Porto Rican, fair quality amber 75-85c per gallon. Beeswax: No trading, and under depressed condition of market difficult to give even a nominal quotation.

CHICAGO.—No carlot arrivals, but a number small lots from Colorado, California, Wisconsin, and Ohio arrived, totaling 8,000 or 10,000 pounds since Dec. 1. Demand is light and trading very slow. Bottlers are buying even lighter than wholesale grocers, mail-order houses, etc. Comb: Stock is holding generally steady and is scarce. Present offerings from Idaho and Colorado are selling to retailers at $7.00-7.75 per 24-section case. Extracted: Market is weak and gradually declining. Alfalfa and clover from Colorado, Minnesota, and Ohio selling to bottlers, wholesale grocers, etc., mostly 15c, light amber 14c per lb. Beeswax: L. c. l. receipts of foreign and domestic wax, mostly Ohio and Wisconsin have been heavy and market tone is easy. Dark stock, both domestic and imported, is bringing around 32c, light 35c. Most stock sold to harness manufacturers and drug houses.

CINCINNATI.—No arrivals since Dec. 1. Extracted and comb: Supplies liberal. Practically no demand nor movement, market very dull, too few sales to establish market. Beeswax: Supplies liberal. Practically no demand nor movement, market very dull, too few sales to establish market. Beeswax: Supplies liberal, demand and movement moderate, market steady. Sales to large users, wide range of prices, average yellow 38-45c per lb.

DENVER.—Supplies liberal, market barely steady, demand and movement light. Sales to jobbers, extracted: Colorado, white 15-20c, light amber 14½-18c, amber 14-17c. Comb: Colorado, 24-section cases, No. 1 white, $7.20; No. 2, $6.75. Beeswax: Cash to beekeepers, 36c per lb.

KANSAS CITY.—No carlot arrivals since last report. Supplies moderate, demand and movement moderate, market dull. Dealers looking for further decline owing to large supplies still in producers' hands, practically all factors buying only as needed. Extracted: Sales in small lots to jobbers or large users, Californias and Colorados, light amber alfalfa 17-18c. Comb: Sales to jobbers, California, Colorado, and Nevada, light alfalfa 24-section flat cases No. 1, $6.50-7.00. Beeswax: Practically no sales.

MINNEAPOLIS.—Supplies moderate. Market weaker on extracted, but comb is holding steady to retailers. Understand comb can be bought from brokers at slightly less than present stock cost, but dealers are holding off as long as possible. Movement is very slow, most sales being made to retail grocers. Extracted: 60-lb. cans western alfalfa and sweet clover mixed, white 19c, light amber 18c; Minnesota, Wisconsin, and Iowa white clover 20-22c. Comb: No. 1, 24-section cases, western, alfalfa and sweet clover mixed, $8.00; Minnesota, white clover, $7.75-8.00.

NEW YORK.—Supplies very light, practically no demand nor movement. Market weak; confectioners, bakers, and manufacturers not buying on account of plentiful supply of sugar and syrup at low prices, supplies being bought only on hand-to-mouth basis. Dealers believe better prospects in sight after holidays. No carlot arrivals since Dec. 1. Extracted: Sales to jobbers, large wholesalers, confectioners, and bakers, Californias, light amber alfalfa 10-12c; white alfalfa 12-14c, light amber sage 14-16c, white orange blossom and white sage 15-17c. West Indian and South American, refined, 60-70c per gallon. Comb: Supplies practically exhausted, too few sales to establish market. Beeswax: Practically no demand nor movement. Market dull, buying being done only in very small quantities for current demand. Sales to jobbers and wholesalers, South Americans and West Indian, light, 20-22c, dark 18-20c per lb.

PHILADELPHIA.—No arrivals except few small lots of near-by stock. No demand nor movement. No sales reported.

ST. LOUIS.—No arrivals reported since Dec. 1. Comb: Supplies are liberal. Very little movement reported with no better prospects before the first of the year. Sales in small quantities, direct to retailers, per 24-section cases, Colorado, white clover and alfalfa, $7.00-8.00, mostly around $7.00. Extracted: Supplies liberal. No sales on honey in barrels reported, and stock in cans reported moving slowly. Sales to wholesale grocers, large buyers and jobbers, in 5-gallon cans per lb. California, light amber alfalfa 15-16c; Mississippi and Arkansas light amber mixed various flavors 15c; Colorado, white clover and alfalfa 17-18c. Beeswax: Supplies light. Demand very light and practically no movement. Market is weaker. Nominal quotation to jobbers and manufacturers of floor wax and comb foundation, prime yellow 28c per lb.

GEORGE LIVINGSTON,
Chief of Bureau of Markets.

Special Foreign Quotations.

LIVERPOOL.—The value of extracted honey at today's rate of exchange is 12 to 13 cents per pound. The value of beeswax in American currency is from 27 to 29 cents per pound.

Liverpool, England, Dec. 7. Taylor & Co.

CUBA.—Honey is quoted today at 75 cents per gallon; wax brings $20 per quintal of 100 pounds.

Matanzas, Cuba, Dec. 8. A. Marzol.

Opinions of Producers.

Early in December we sent to actual honey-producers, scattered over the country, the following questions:

1. Is honey moving onto the market in your locality.
2. Are honey-buyers at all active or inquiring for honey?
3. Have honey-producers in your region made any effort to create or find a local market?
4. What is the wholesale price for honey in your locality? For extracted? For comb?
5. What is the retail price? For extracted? For comb?

Answers, as condensed by the editor, are as follows:

BRITISH COLUMBIA.—Honey is moving on to market, and buyers are active. There is a ready local market for all we can produce for some time to come. The wholesale price for extracted honey is

30c per lb., comb 42c per section. Retail price is 50c in one-pound glass jars for extracted, for comb 50c per section or $1.75 in 4-pound cans.—W. J. Sheppard.

CALIFORNIA.—Buyers are not active. Producers are making very little effort to find a local market. Retail price of extracted honey is 20-25c; comb, 35-45c per section.—L. L. Andrews.

CALIFORNIA.—Buyers are not active. Producers are making efforts to find a local market. There seems to be no uniform price at wholesale. In fact, no offers. Retail price of extracted honey is 25-30c; comb, 30-35c—not any nice white in market.—M. H. Mendleson.

COLORADO.—Honey is not moving on to the market to any great extent, and buyers are not active. Efforts in the line of finding a local market have been mostly in the nature of crowding in on others' markets by cutting prices. Wholesale price of comb honey is about $6.50 per case. For extracted honey the retail price is 14c and upward; for comb honey, the price is 20-30c per section.—J. A. Green.

FLORIDA.—Honey is not moving well, tho buyers are active. Producers are making efforts to find local market. For extracted honey the wholesale price is 65c to $1 a quart, and at retail $1.00-1.50. No comb honey at present. Bees are in fine condition for winter over most of Florida.—C. H. Clute.

FLORIDA.—Honey is moving slowly, and buyers are not active. Producers are making efforts to find local market. Wholesale price of extracted honey is 15c; at retail, the price of some is as high as 25c.—Ward Lamkin.

IDAHO.—Honey is moving in part; comb all sold, and a few cases of extracted. Producers are trying to find a local market, but local demand can not absorb the big production. For extracted honey the wholesale price is 15-20c; carlots sold at 15c; fancy comb in carlots $7.00 per case. The retail price of extracted is 40-50c per pint jar; comb often sold at or near the car-lot price by small producers.—E. F. Atwater.

IOWA.—Honey is moving slowly, and buyers are not very active. Producers are not making any more effort than usual to find a local market, but local demand has been good. No extracted honey at wholesale has changed hands of late. Comb sells at wholesale for $6.50-7.00 per case of 24 sections and retails at 30-35c. Extracted honey retails at 25-30c. All honeys here are largely out of first hands.—Frank Coverdale.

KANSAS.—Honey is moving fairly well. Buyers are not at all active. Producers have already sold out. Wholesale price of extracted honey is 25c, comb $7.00 per case. Extracted retails at 28-30c, and comb at $8.50 per case.—J. A. Nininger.

MARYLAND.—Honey moving very slowly. No buyers in Maryland. Some producers have tried to find a local market. Wholesale price for extracted honey is 22-24c, for comb 28-30c. Retail price of extracted is 35-45c, for comb 40-50c.—S. G. Crocker, Jr.

MISSOURI.—Honey all sold. Buyers are well supplied, very little demand. We were never able to supply home demand. For extracted honey the wholesale price is $2.50-3.00 per gallon, and for fancy comb $8.50 per case. Extracted is retailing at $3.00-3.50 per gallon, and fancy comb at 40-50c.—J. W. Romberger.

NEBRASKA.—Honey moving very slowly. Wholesale price of extracted honey is 25c, comb 28-30c. Retail price for extracted 35c, comb 33-38c. —F. J. Harris.

NEW YORK.—Honey is moving slowly. Producers are making very little effort to find a local market. The prices are about the same as last month.—Geo. H. Rea.

OKLAHOMA.—Honey is moving slowly. Producers have made some effort to find a local market. Wholesale price of extracted honey is 25c, comb 35c. Retail price of extracted is 30c, comb 40-45c.—Chas. F. Stiles.

ONTARIO.—Honey is moving very slowly. Buyers are very cautious and not stocking to any extent. The smaller producers are working the local market in every way. Some of the large producers produce too much honey for local purposes. Wholesale price for extracted honey is 24-26c, comb 30-40c. Retail price for extracted is 30-40c, comb 40-55c. Dark extracted honey is moving slowly at considerably lower prices than light honey.—F. Eric Millen.

TEXAS, EAST.—Honey is moving slowly. Buyers are not active. Honey-buyers are trying to find a local market. The wholesale price of extracted honey is 15 to 20c; at retail, 20-25c. No comb. Strained honey is selling at 5c less than extracted.—T. A. Bowden.

TEXAS.—No honey in the hands of producers. Demand strong. Local market good. Wholesale price for extracted honey is 14c, comb 18c. Retail price for extracted 16c, comb 20c. Bees are in fine shape, with plenty of stores.—J. N. Mayes.

TEXAS.—Honey is moving on to the market, and buyers are normally active. Producers are making no effort to create a local market. Wholesale price for extracted honey is 10-14c, and the retail price is 18-20c.—H. B. Parks.

UTAH.—Honey is moving very nicely locally, but buyers in carlots are not active. Producers are trying, and finding it profitable, to create a local market. Wholesale price for extracted honey is 16c; at retail, 20-22c. No supply of comb honey.—M. A. Gill.

VIRGINIA.—Little demand for honey, and producers are making very little effort to find a local market. Wholesale price of extracted honey 20c, comb 32-38c. Retail price for extracted 25-35c, comb 50c.—J. H. Meek.

WASHINGTON.—Honey is not moving nor are buyers active. Producers are trying to find a local market. Wholesale price of extracted honey is about 18c, retail about 25c.—Geo. W. B. Saxton.

WISCONSIN.—Honey is moving in a local way thruout the entire State. I have received no reports from beekeepers concerning offers. Where beekeepers have attempted to create a local market, practically all of the crop has been disposed of. The wholesale price of extracted honey is 20-25c, practically no comb honey available. Retail price of extracted is 30-35c, comb 40-50c.—H. F. Wilson.

Too Late for Classification.

WANTED—Bees to handle on shares. Address
D. P. Hunt, Blum, Texas.

WILL exchange a new phonograph for an extractor and bee supplies. What have you?
Olf. Hegre, Madison, R. D. No. 2, Minn.

PACKAGE BEES and NUCLEI with ITALIAN QUEENS, for spring delivery. No disease in our yards. Write for prices and terms.
The Allenville Apiaries, Allenville, Ala.

WANTED—Single man, 32, wants work in modern apiary to learn business. Had bees eight years as sideline. South preferred. Start any time.
Karl E. Colt, Brocton, N. Y.

WANTED—First-class county bee inspector, one who knows the business thoroughly. Answer giving particulars of your experience and say what salary you want. Work in California.
C. P. Dandy, El Centro, Calif.

WANTED—Beekeeper with some experience for work in our apiary on Key Biscayne during the season of 1921, to begin February 1 under the directions of C. E. Bartholomew, who was formerly with the Department of Agriculture.
Hugh M. Matheson, 1608 Ave. G., Miami, Fla.

PROGRESS TREES and PLANTS GROW

because they are propagated right, dug carefully, and packed securely. Write for our Catalog and NO-RISK offer of trees, shrubs and plants. We pay express charges. Why pay for your trees before you get them? It's not necessary if you deal with **THE PROGRESS NURSERY COMPANY,**
1317 Peters Avenue Troy, Ohio

SPECIAL PRICES

—ON—

FRICTION-TOP PAILS

	50	100	200
5-Pound Pails	$5.25	$10.00	$19.00
10-Pound Pails	8.00	15.50	

10-Pound Pails in boxes of six,
per box, $1.40
5-Pound Pails in boxes of twelve,
per box, $1.75

F. O. B. cars Lansing. No early order discounts allowed at above prices. Can make immediate shipment till present stock is exhausted.

Special prices on application on 12-pound and 16-pound comb honey cases.

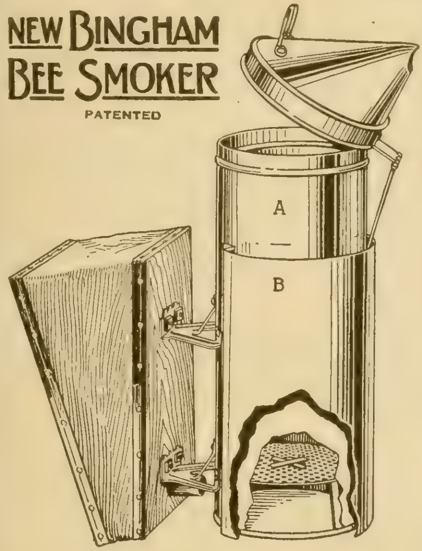
Four per cent early order discount for January cash orders except as noted on friction-top pails listed above.

⁂

M. H. Hunt & Son
510 North Cedar Street
Lansing, Michigan

NEW BINGHAM BEE SMOKER

PATENTED



The Bingham Bee Smoker has been on the market over forty years and is the standard in this and many foreign countries. It is the all-important tool of the most extensive honey producers in the World. It is now made in five sizes.

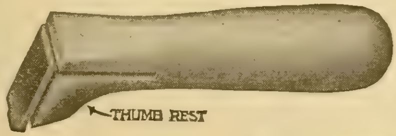
Postage extra	Size of stove inches.	Shipping weight lbs.
Big Smoke, with shield	4 x10	3
Big Smoke, no shield	4 x10	3
Smoke Engine	4 x7	2¼
Doctor	3½x7	2
Conqueror	3 x7	1¾
Little Wonder	3 x5½	1½

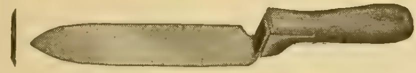
The Big Smoke has just been produced in response to a demand for a larger-size smoker, one that will hold more fuel, require filling less often, from extensive bee handlers.

East Lansing, Mich., May 10 ,1920.
A. G. Woodman Co., Grand Rapids, Mich.

Dear Mr. Woodman:—I have now had several weeks' opportunity to try out the New Smoker called the Big Smoke, with the guard about the fire pot. The smoker is even more than I anticipated and unless something else is brought out that is still better, you can be assured that this particular one will be standard equipment for this place from now on.

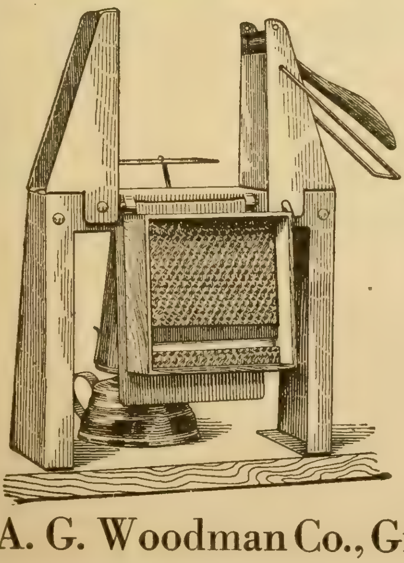
B. F. Kindig,
State Inspector of Apiaries.





The Genuine Bingham Honey Uncapping Knife is manufactured by us here at Grand Rapids and is made of the finest quality steel. These thin-bladed knives, as furnished by Mr. Bingham, gave the best of satisfaction, as the old timers will remember. Our Perfect Grip Cold Handle is one of the improvements.

The Woodman Section Fixer, a combined section press and foundation fastener, of pressed steel construction, forms comb-honey sections and puts in top and bottom foundation starters, all at one handling. It is the finest equipment for this work on the market.



TIN HONEY PACKAGES

2 lb. Friction top cans, cases of 24.
2 lb. Friction top cans, crates of 612.
2½ lb. Friction top cans, cases of 24.
2½ lb. Friction top cans, crates of 450.
5 lb. Friction top pails, cases of 12.
5 lb. Friction top pails, crates of 100.
5 lb. Friction top pails, crates of 200.
10 lb. Friction top pails, cases of 6.
10 lb. Friction top pails, crates of 100.

Special prices on shipments direct from Chicago now.

100 5-lb. friction top pails	$ 8.50
100 10-lb. friction top pails	12.50

Ask for our special money-saving prices, stating quantity wanted.

Send us an itemized list of your requirements and let us figure on your goods for 1921. Our new catalog will be issued about Jan. 1.

A. G. Woodman Co., Grand Rapids, Mich., U. S. A.

BACKED BY OUR REPUTATION

HAVE YOU EVER thought how many beekeeping devices, hives, etc., once boomed and sold extensively have had a mushroom sale—to be discarded as worthless when exposed to the light of careful investigation and thorough trial?

HAVE YOU EVER gotten anything made and recommended by us that did not stand the test of usage and time?

Why? Because we put out only such articles as have proven thoroughly satisfactory to us; those which we have ourselves used and tested extensively and long.

OUR SPECIALTIES

DADANT'S FOUNDATION—As near to the perfection as we can make it. Tested in our apiaries—manufactured and packed under our personal supervision.

ELECTRIC IMBEDDER—It cements the wires in the wax. Makes hauling of wired combs to out-apiaries feasible, reduces sagging to a minimum.

BEE BOOKS—Containing authentic and comprehensive information on bee culture. Special books for special branches of beekeeping. A credit to any library.

MODIFIED DADANT HIVE—The large hive—a hive that accommodates the prolific queen, cuts down swarming, helps in wintering. Booklet for the asking.

DADANT'S FOUNDATION

Every inch, every pound, every ton equal to any sample we have ever sent out. Specify it to your dealer. If he hasn't it, write us.

DADANT & SONS

HAMILTON, ILLINOIS

Catalog and prices on bee supplies, beeswax, wax working into comb foundation and comb rendering for the asking.

GLEANINGS IN BEE CULTURE

JANUARY, 1921

EDITORIAL

"Give Us This Day Our Daily Bread."

AS I WRITE on this 17th of December, everybody is thinking of Christmas giving, and I fear giving but little thought of the, not hundreds and thousands but *millions*, who are starving for food. The Christian Herald will tell you all about it, and they are also prepared to get the food quickly and surely to the suffering ones. At this very time our *farmers* are suffering because of the low prices offered for our great crops of grain, even burning good corn for fuel. Now, ye followers of the Lord Jesus Christ, and all others who love suffering humanity, "get busy" and "give gifts" to starving women and children by sending the money to purchase the grain of the farmers and at the same time giving "daily bread" to the starving multiudes, and thus "laying up treasure in heaven," instead of here on earth. "Prove me now, saith the Lord of Hosts, if I will not open you the windows of heaven, and pour you out a blessing, that there shall not be room enough to receive it." A. I. Root.

* * *

Soil and the Beekeeper.

DO BEEKEEPERS realize how much their prosperity depends on the character of the soil in their respective localities? Do they realize, too, how important to them is the science of soils, and how much they have to hope for from the increased attention that is everywhere being given to the study and testing of soils?

That great authority on honey plants, John H. Lovell, has recently expressed the following opinion: "It is becoming more and more clear that the conclusions of beekeepers in regard to nectar secretions must be accepted with reserve. For example, white clover does not secrete nectar well, even when abundant, on an acid soil; and should I today receive a report from a New York beekeeper that white clover was an excellent honey plant in his locality, I should at once refer to the soil map of New York, and, if I found that the soils of his section were acid, little importance would be attached to his statement. Certain New York beekeepers from ignorance of soil conditions have made mistakes in locating out-apiaries."

Dr. E. F. Phillips, in charge of bee investigations for the United States Department of Agriculture, is going deeply into the study of soils as related to bee culture. He has recently had an elaborate soil-measuring apparatus put in his department.

* * *

A Memorial for Dr. C. C. Miller.

FROM VARIOUS sources come suggestions that a fund should be raised by American beekeepers to establish a permanent memorial for the late lamented Dr. C. C. Miller. Gleanings is in receipt of a number of letters suggesting that such action be taken. Mr. C. P. Dadant in the American Bee Journal calls attention to the matter and proposes the establishment of a research scholarship in beekeeping in an agricultural college as a memorial, E. G. LeStourgeon of San Antonio, Tex., president of the American Honey Producers' League, warmly seconds this idea, and suggests Mr. Dadant as chairman of a committee of three or five members, to be appointed by him, who shall have the whole matter in charge.

Gleanings heartily favors a lasting memorial for Dr. Miller, and seconds the nomination of Mr. C. P. Dadant as chairman of a committee to undertake the raising of funds and deciding as to what form the memorial shall take. We would only suggest that a popular subscription be asked in which even a dime given by any true friend of the late great beekeeper shall be as welcome as a dollar or ten dollars, for we feel sure that he would appreciate the number of his friends rather than their ability to give. Let thousands of beekeepers contribute, much or little, as they are able, to this good and lasting cause. We can do nothing better than to perpetuate the virtues and memory of a good man.

Gleanings will help in every way it can in this cause, and is ready to receive contributions. Lead the way, Messrs. Dadant and LeStourgeon.

Alsike Clover.

THE FARMERS' BULLETIN on Alsike clover, to which reference has been made in our Books and Bulletins Department, should be in the hands of every beekeeper in the clover regions, but better still it should be in the hands of every farmer within this region. As the farms grow older and the difficulties in securing a stand of red clover increase, this excellent honey plant is gaining in favor among farmers, especially when mixed with red clover or timothy, thus insuring a stand on cold or wet soil where red clover fails to catch. If you are in the clover region, why not see that your farmer neighbor gets one of these bulletins?

* * *

Isle of Wight Disease.

THE ANNOUNCEMENT of the discovery of the cause of the ''Isle of Wight'' disease, which appeared in press reports in England last month, has been confirmed by later reports, and we hope that Dr. Rennie's report on the investigations leading to this discovery will be published soon. According to the press reports the cause of the Isle of Wight disease is a mite ''which enters a particular breathing tube of the bee, feeds on the bee's blood, blocks the air passage, and thus cuts off the supply of oxygen from certain muscles and nerve centers concerned with locomotion.'' The name **Tarsonemes Woodi** has been proposed for this mite, in honor of A. H. Wood, who, it appears, assisted in financing the investigation.

It is to be hoped that the many puzzling things in connection with this disease will be cleared up by this discovery. It may also throw some new light upon the diseases of adult bees in this country.

* * *

Unsatisfactory Flights Before Cellaring.

WEATHER CONDITIONS during November were not favorable to the kind of cleansing flight which the beekeepers who winter in the cellar like to see just before putting their bees away for the winter. It was not cold enough early in the month to put the bees in a condition to desire a flight, and during the few days when flight was possible later in the month the bees did not fly freely, tho within the southern range of cellar wintering these flights were probably adequate. There was no time late in November when the temperature was high enough to tempt the bees not needing a cleansing flight to fly freely, and many bees were, therefore, put into the cellar without a satisfactory cleansing flight. It is to be hoped that this condition is not a serious one, since the bees were not exposed to very low temperatures before being put into the cellar; but, unless the stores are of the best quality, the bees may become quite restless before they can be taken out of the cellar next spring. Here at Medina the bees outside flew freely on December 12 and 13. Colonies wintering outside are now in excellent condition to endure a period of confinement if necessary.

* * *

Business Methods in Beekeeping.

IT IS with great satisfaction that we announce that Morley Pettit will contribute a series of articles for Gleanings, the first of this series appearing in this issue. Mr. Pettit needs no introduction to our readers, since he has been prominent among beekeepers for some time as the founder of the department of beekeeping in the Ontario Agricultural College, and more recently as a successful honey producer at Georgetown, Ontario. Mr. Pettit and his sister, Miss R. B. Pettit, have built up a thriving business in honey production by applying carefully thought-out business principles to the operation of a series of out-apiaries, and he now proposes to tell the readers of Gleanings how this has been accomplished.

* * *

Keep More Bees Per Hive.

AT THE very beginning of the recent great expansion in beekeeping by the establishment of out-apiaries for extracted-honey production, W. Z. Hutchinson launched the slogan, ''Keep More Bees.'' Later, when it began to look as tho some of the big fellows had gone beyond their limit as to number of colonies, the slogan was changed to ''Keep Bees Better'' and ''Keep Better Bees.'' Now comes Jay Smith, in the Western Honey Bee, with a new slogan that fits exactly the present-day needs and the present-day tendency in beekeeping when he says ''Keep More Bees Per Hive.'' This should be the beekeepers' slogan for 1921 and perhaps for many years to come.

* * *

Distinguishing Between Brood Diseases.

AT THE Ontario convention the question was raised as to the possibility of the beekeepers' being able to distinguish with any degree of certainty between American foul brood and European foul brood without sending a sample for laboratory diagnosis. It was brought out in the discussion of this question that there is still much confusion among beekepers and even among some of the inspectors in regard to these brood diseases.

The beekeeper who has had experience

with American foul brood alone finds the problem of diagnosis comparatively simple since in this disease the symptoms are fairly constant. In the case of European foul brood, however, diagnosis from appearance only is more difficult since in this disease there is a wide variation in the appearance of the dead larvae or pupae. It sometimes happens that experienced beekeepers who have long dealt with American foul brood and who have had no question as to their ability to diagnose this trouble correctly, will suddenly lose confidence in their ability in this respect after coming in contact with the varying symptoms of European foul brood. Many beekeepers have decided that there is no use trying to learn to distinguish between the two brood diseases since, as they say, they are sometimes much alike in appearance. Some have even contended that there is a third disease which behaves somewhat like European foul brood but resembles American foul brood, while others contend that there are two or three kinds of European foul brood.

The thing to remember is that the same organism is responsible for the death of the larvae or pupae in this disease even tho there is a great difference in the appearance after death. The truth is, however, the beekeeper **can** learn to distinguish between these two diseases with sufficient accuracy for his needs in most cases, if he is willing to make a careful study of the gross appearance and behavior of the two diseases. This is a good time to study the descriptions given in the bulletins on bee diseases from the Bureau of Entomology at Washington, D. C., as well as the various state publications and the text-books on beekeeping.

Inspectors of apiaries especially should be thoroughly familiar with the variations in the gross appearance of European foul brood as well as the finer distinctions between the two diseases in those cases in which European foul brood resembles American foul brood in appearance, for it is of utmost importance in the treatment to know which of the brood diseases is present. If the wrong treatment is given the trouble is usually made worse than before, and many expensive mistakes have been made thru mistaken diagnosis both by beekeepers and inspectors. In all cases of doubt a sample should be sent to the Bureau of Entomology at Washington for a laboratory examination.

* * *

The Honey Market Situation.

SINCE OUR last issue the honey market in a jobbing way has not improved. There are two reasons for this: (1) Buyers' waiting to to see what is going to happen, (2) no export demand. While a little honey has gone to Europe, the amounts have been so small as to be practically negligible.

In the meantime the sugar market continues to decline. When honey and sugar were competitors a fall in sugar meant a corresponding drop in honey; but that is hardly true today. During the great war, sugar could be had in only very limited quantities, or not exceeding two pounds at retail. Europe could get scarcely any. Honey and cane syrup, and especially honey, then began to go to Europe in car lots to take its place. Honey was bought and used in place of sugar in a very large way all over this country. While it is still used by bakers, we must consider that honey now stands on its own bottom to a very great extent. No matter if granulated white sugar does go down in price, we are not now to expect that honey will, in consequence, follow suit. Sugar, in car lots, can now be had at one-third or even one-fourth of the former inflated price. Honey, on the contrary, in car lots has dropped scarcely more than a half from the prices that ruled during the war. This is very encouraging in that it goes to show that in a very large way honey is not now acting in sympathy with sugar. It has gone back to pre-war conditions in that it holds a field of its own apart from sugar.

Still further, it is encouraging to note that, in a **retail** way, extracted honey is almost if not entirely up to war prices now. While it will probably not stay there, the fact that it does hold its own so long and so tenaciously when sugar at retail has made a sharp decline, suggests the possibility that the jobbing price of honey may come up.

It is further encouraging to note that, while there are a few large stocks of western honey available in car lots, honey east of the Mississippi has been pretty well used up.

It is encouraging to note further that **comb** honey, both in car lots and in a retail way, is still holding even a higher price than it did during the war. The beekeeper who can produce comb honey, therefore, should produce all he can for the next season. In saying this it should be understood that not all honey is suitable for putting in sections. For example, some southern honeys are very much inclined to show ooze, or look watery when held in the combs. But there is no reason why clover of all kinds, raspberry, alfalfa, sage, orange, and pure gallberry should not be produced in the form of comb honey; and the wise beekeeper who has the equipment and locality, in view of the high prices that this kind of honey is commanding, will put himself in position where he can produce that which will have a big market at high prices next season. If he has not the equipment he should lose no time in getting it, as it takes time to get comb-honey supers all ready for the hives.

REAL APIARY MANAGEMENT

The Beekeeper as a Business Manager. How to Increase the Morale of the Helpers

By Morley Pettit

During the Great War we read in the press reports from day to day of the "morale" of our brave fighting men, or of the lack of it in the armies of the enemy. This has given us a name for a desirable condition which we have come to call "colony morale." Now it would seem fitting to apply the same term to the beekeeper and his helpers, and speak of "Apiary Morale." As the workers of the bee colony are kept in working mood by proper conditions, so the morale of the human workers is maintained by good management.

Success in beekeeping depends largely on the mental attitude of the beekeeper. He must have faith in his business as a business, and not regard it as a sideline or an experiment or a stepping-stone. What attracted me most in the teachings of the late lamented Dr. C. C. Miller was the fact that he resigned both a musical and a medical career, in each of which his prospects were bright, and taught the world that beekeeping, a far more obscure calling then even than now, is one good road to health, happiness, and a comfortable income.

The beekeeper who has made a right start by facing the fact that he has tackled a man's job worthy of his best effort, must have faith in his locality, or get into one which he can trust. I am coming to think more as the years go by that there is less variation in localities than in the beekeepers who occupy them. Last but not least, the beekeeper who would succeed must have faith in himself and his methods, and not be turned about by every wind that blows. In order to have this faith he must have within himself the elements which make for success in any line: Good health, diligence, foresight, close observation, careful attention to details but a sense of proportion. He must have the will-power to do the profitable things and to leave undone the unprofitable. He should be willing to take a chance when it is a chance of increased profit, but never when it is a chance of ordinary success versus failure. The really successful beekeeper knows the "Why?" of the various manipulations; he understands the principles involved in good beekeeping and bases all his methods and appliances on these principles, and not on what he prefers or someone else says.

Office and Equipment.

Having all these elements of success within himself, the one who makes a success of a large commercial honey-producing enterprise works out a system of management which keeps all hands alert and the work running like clockwork in the most difficult and irregular of seasons. This takes not only careful planning but an abundance of supplies properly distributed and a good staff of active and willing helpers.

At the Pettit Apiaries the plans center in the little office next to the carpenter shop upstairs in the main building. It is just a small room plainly finished with a good desk and comfortable swivel chair, and a stove for the cool days of spring and fall. Around the walls are shelves of books, journals, and bulletins, and files for records and letters. One window overlooks the home apiary for inspiration, altho I can assure you that not much daylight time is spent here during the active season. This office is connected by telephone with the dwelling where the sister member of the firm has her desk for taking care of the selling and shipping records. In addition to being sales-manager, Miss R. B. Pettit is the queen-breeder of the firm and looks after all requeening and increase. With one or two helpers for the muscular work, she takes her share of apiary management right thru the season.

In 1920 there were seven yards with about 450 colonies, spring count. These were increased to 567 and will be in eight or nine yards in 1921. The weekly visit, which has always been our rule, has been extended to a trip to each yard once in eight or ten days according to conditions. Practically all supplies are kept at home to be overhauled, cleaned, sorted, etc., and taken to the different yards on the regular trips as needed. To simplify the work we have standardized equipment, as far as possible without throwing away too much material that is still useful or refusing to adopt changes which are sure to increase profits. In fact, we keep an experimental department going all the time.

Transportation is by means of a ton truck, a light truck, and a Dodge roadster which has good carrying space for queen-rearing appliances in the back. Whichever two of the cars the loads require go out each day, so we can do up one large yard or two smaller ones daily when necessary. We use three student helpers, who come to us in April and even have to learn the names of some of the appliances. They supply muscular activity and try to follow directions, while we plan and direct and do a share of the work.

There has been a great deal of boasting on the part of beekeepers about how many colonies one man could manage alone. It is true that efficiency in this line should be cultivated to the fullest extent. At the same time I feel that a season spent in apiary work is just that many months measured off my life. If I have spent those months toiling harder and longer hours than my strength warrants, they have been wasted; but if I can profitably employ help and equipment so as to make the work pleasant, how much better it is! On the other hand, I think it pays to employ help enough so I can attend to details for which many producers say they have not time. I endeavor to strike the happy medium between management which is too intensive and that which extends so far as to become unprofitable.

Management Facilitated by Useful Records and Memoranda.

Besides having the best of equipment and plenty of it we study constantly for the best and simplest of methods. These also are standardized as far as possible and are based on sound principles of bee-behavior so far as they have been determined. Not only is each colony given individual attention, but varying conditions of each location are noted on the different trips. For this purpose we have a set of records which tho exceedingly simple enable us to plan intelligently for the next trip. The individual hive records simply show the age and parentage of the queen, and the number of supers of honey taken. The dates of dequeening and requeening are also noted on the hive. That is practically all the colony records kept. The queen-rearing records are another matter.

The record of visits to each apiary is kept on a plain 3 x 5-inch card, which bears a letter representing the name of the yard in question, such as N for the North yard, H for the Home yard, and so on. These yard cards are filed in the desk according to the dates on which the next visits are to be made. Each visit to the N yard, for instance, is recorded on the N yard card with one or two words showing what was done, and the nature of conditions found; e. g., ''May 11, finish clipping, supering;'' ''May 26, unpack and super, all have 1 and many 2 supers.'' If the record shows a yard well supered and no swarming impulse, and if the weather is backward the next visit may be delayed provided queen-rearing operations there do not demand attention. To avoid extra trips we must be sure to take all supplies that may be needed on the regular trip. While at the yard I jot down on a piece of memorandum paper items of importance to remember when preparing for the next trip, such as the nature of work just completed, special notes on condition of bees and supers, and supplies needed next day which are being left stored or must be brought. I find this absolutely necessary and yet sometimes have to drive myself to do it, as it is usually a scramble to get thru in good time, and it is all so plain then that there seems no danger of forgetting. But tomorrow it will be a different yard, and the next day another, until the memory of details becomes scrambled.

There is a particular pocket where these memoranda go, and this pocket is emptied into a certain wire basket on the desk, and this basket is overhauled frequently in the evenings or early mornings to write up the records and notes for future trips. Records go on the yard cards concerned, as indicated above. Notes of supplies left or to be taken are used for making out the load list for that yard on the next trip. The load list for each trip is another item which seems like a small matter, yet I have found it very helpful in relieving me of responsibility. The following would be a typical list handed to the man who is to go with me to the K yard. ''List for K, Mon., June 28/20. Ton truck, water radiator, oil motor, pump tires, 65-lb, 50 supers, combs, 25 queen-excluders, 10 cloths, smokers, veils, lunches, saw, hammer, nails, hive-tools, drinking water.'' He carries this list around with him while he is making up the load and checks it over the last thing. If he did not have the list we might arrive minus some essential, such as smokers. I have never known the lunches to be forgotten. For personal use I also make a list of work to be done which I might forget. These lists are fastened with a wire clip to the yard card, which is filed ahead under the date assigned for the next trip. This is simply the ''tickler system,'' so common in business offices.

If we ever get where we have more store combs than we are likely to need, it will enable us to manage more yards with the same number of trips. So long as we are increasing, this is not likely to be, especially since we are not at home for making up supplies in winter, but must work that in with the work of the active season. If each colony before the beginning of the honey flow could be given all the combs it would likely fill, the next visit could be longer delayed. The next best is to give each two or three supers, then add foundation as further room is needed, keeping some combs in reserve at home for a big run in any yards that are so fortunate as to get it. The yard card records are particularly valuable here, and the truck with capacity for a hundred supers enables reinforcements of storage space to be brought quickly to the front where there is the greatest need.

Outline of Season's Work.

We open up and do shop work in April. As weather permits, queens are clipped and first supers added in the winter cases. Unpacking is finished in May before a second super would be needed. Queen-rearing is started as early as possible so that failing and swarming queens may be replaced as soon as discovered. By the latter I mean those whose bees persist in building cells. We extract in late July and early August and return most of the supers to the hives. September is for final taking off and packing, October for feeding, and November for finishing up.

We find more advantages in the central-plant system from year to year. Specializing is essential to the highest success. Very few men succeed in practicing law and medicine at the same time. I would not know how to manage without a fairly well-equipped office. Others may be able to keep in mind a picture of conditions at all their yards, and carry their plans in their heads, but where so much has to be crowded into a few months it is risky. Then we have a variety of locations, and always changeable seasons. With plans well-charted and work well up, we are ready for emergencies. Otherwise one is liable to see what should have been done after it is too late.

Georgetown, Ont.

BEEKEEPING IN THE SOUTH

Elton Warner, the Bee-king of Several States and of Porto Rico

By E. R. Root

I SHALL not tell you how many colonies this bee-king has nor where they are located; but his bee operations are scattered thru North Carolina, South Carolina, and Porto Rico. You would take him to be a college professor or a manager of a steel plant. Modest to a fault, he has a polished mannerism that is delightful. He is also something of a student of human nature, as he apparently knows how to handle his helpers and get the most out of them. Besides being one of the most extensive beekeepers in the world, he is a real all-around genius.

Fig. 1.—Mr. Elton Warner.

Fig. 2.—Elton Warner and his beeyard force; picture taken near Mullins, N. C. From left to right, they are: S. W. Savage, Mr. Warner, J. P. Rodriquez, and N. E. Ladd.

I had the pleasure of spending several days with him in two different States, looking over his bees; and when I came to ask him why he happened to locate in so many different places along the swamps he pulled out some elaborate-soil-maps which he had studied very carefully. These are maps that almost any one can obtain from the Department of Agriculture of each of the various States. After having studied the soil conditions he afterward made personal visits to inspect the honey flora of the locality. Having selected his location, he next buys bees in box hives and then transfers them. He now has some very beautiful up-to-date yards, located near the swamps where abound the tupelo and the gum trees and on the uplands the gallberry.

Fig. 3.—The big fellow is the Ladd that can pick up 13-frame hives full of bees as easy as pie.

Fig. 4.—One of the box-hive apiaries that Elton Warner bought and transferred.

While Mr. Warner has his headquarters

at Asheville, N. C., his main bee operations are confined to South Carolina and Porto Rico. This simply means that his yards are located thousands of miles apart. It is a big job to handle yards all within a range of a hundred miles; but it is a vastly bigger job to manage helpers and oversee yards scattered all the way from North Carolina to Porto Rico. Mr. Warner is not only a first-class beekeeper, but he is also a business man—not one of the kind that splits a penny or drives a sharp bargain, but one who studies the times, and particularly the markets. While he was born in the United States he has spent a large part of his life in Porto Rico. He speaks Spanish fluently, and one of his best yard men, Mr. Rodriguez, is a native Porto Rican.

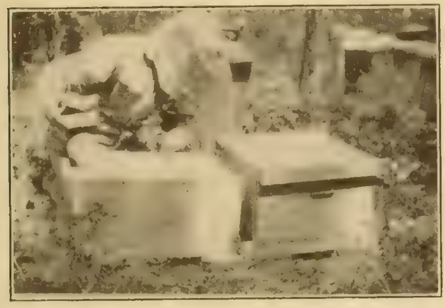


Fig. 5.—Mr. Warner smoking and drumming bees from a box-hive into a modern hive.

Uses the 13-Frame Hive.

We have heard a great deal about large hives, especially the thirteen-frame ones. I was not a little surprised to find that our friend is a user of this big hive, and a strong advocate of not only strong colonies but also large brood-chambers. When we went thru his apiaries it was easy to see why he was successful, because he had colonies big enough so that they were ready to do a rushing business when the honey flow began.

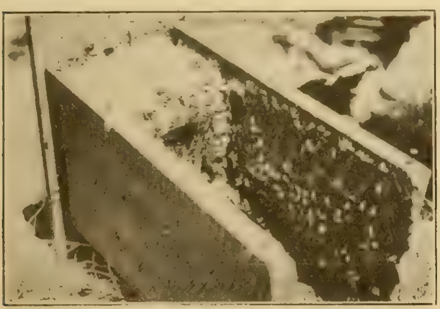


Fig. 6.—After the bees are drummed out the combs are cut out; but only brood inserted in the frames.

I took a number of photos of Mr. Warner in action. The legend under each of the pictures will explain.

His Plan of "Drumming Out."

Mr. Warner has a manner of drumming the bees from a "gum" laid on its side into a movable-frame hive, on the plan illustrated in Fig. 5, which shows him in the act of doing this trick of the trade, and it is not so very difficult either. After the bees are drummed out the brood is cut out and transferred to regular frames. The rest of the space is then filled out with frames of foundation. I wish to call your attention particularly to the position of Mr. Warner's smoker in his right hand as seen in Fig. 5. Before he begins a job of drumming he bores a ¾-inch hole near the top of the "gum" or box hive. It is then laid on its side with the open bottom placed as close as possible to the entrance of one of his regular 13-frame hives containing frames of foundation. With his smoker he blows volumes of smoke into the hole before mentioned, and at the same time keeps up a vigorous drumming with a hammer as shown.

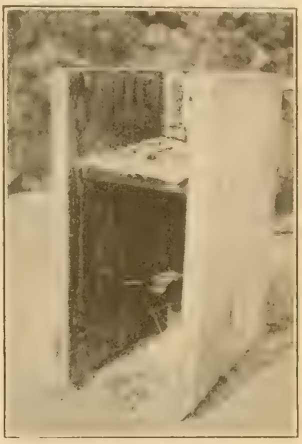


Fig. 7.—Some of these old "gums" have a super or surplus department.

Mr. Warner likes this manner better because it is less trouble to place the old log gum and the modern hive on the same level than it is to place one on top of the other. I watched him drum out a number of colonies in this way, and it appeared to me that they would run in on a horizontal plane as well as they would vertically into a box placed on top. After practically all

Fig. 8.—One of Warner's South Carolina apiaries.

the bees have been drummed out it is a simple matter to remove the combs of brood and put them into frames.

I want to introduce you to some of Mr. Warner's helpers. After considerable persuasion I got them in front of my Graflex, and the result is shown in Fig. 2. I call attention in particular to Mr. Ladd, the man who seems to be built just right to handle 13-frame hives. You would say that he is the Ladd that could do the trick if you could see him in action (Fig. 3).

COMB HONEY PRODUCTION

Spirit of Workers Most Important. Cost of Wax Production. Conditions Under Which Yields of Comb Honey May Nearly Equal That of Extracted

By Geo. S. Demuth

WHEN the honey-extractor first came into use, beekeepers quickly discovered that greater yields are secured when the combs are emptied and returned to the bees to be refilled than when the bees are compelled to build new comb each time. The honey-extractor was at that time heralded as a means of more than doubling the yield per colony, because after the combs were once built, the bees were saved trouble of further comb-building.

Later, when comb foundation was invented, it was thought that its use would be practically equivalent to the use of empty combs for surplus honey, and that this new product would enable the bees to store practically as much comb honey as extracted honey. In this beekeepers were disappointed, and it is now generally agreed that greater yields are secured when producing extracted honey. No agreement, however, has ever been reached as to just how much more extracted honey a colony will produce than comb honey.

Cost of Wax Production and Comb Building.

In most of the discussions of this subject the difference in the yield for the two types of honey is attributed to the amount of honey that is consumed in the elaboration of wax for comb-building. Some of the earliest experiments in wax production indicated that 20 pounds of honey are consumed by the bees in the production of one pound of wax. For a long time this was accepted as the true figure. Since comb sufficient to hold 100 pounds of honey contains from four to five pounds of wax, the bees, in secreting the wax necessary to build this amount of comb, would consume nearly an additional 100 pounds of honey, if the ratio of 20 pounds of honey to one pound of wax is assumed to be correct—to say nothing of the time and energy used by the bees in secreting the wax and building the comb. From this, as well as from actual results year after year in producing the two types of honey it was believed by many that two pounds of extracted honey could be produced to one pound of comb honey. When full sheets of foundation are used in the sections the amount of wax thus furnished is about one pound for each 100 pounds of honey; but, to offset this, considerable wax is used in extracted-honey production in elongating cells and capping the honey.

The ratio of two pounds of extracted honey to one pound of comb honey is probably not far from correct as an average for all localities, all seasons, and all beekeepers; but, in some locations during favorable seasons, the skilled comb-honey producer secures nearly as much comb honey per colony as extracted honey. This has led to a revision downward of the amount of honey supposed to be required to produce a pound of wax, which present-day authorities put at from six to twenty pounds.

Involuntary Wax-Secretion.

It is believed by many that a considerable amount of wax is secreted during a good honey flow whether it is needed or not, and some writers have contended that under certain conditions much of this wax is wasted if the bees are not given an opportunity to build comb. One of the first indications of the beginning of the honey flow is the appearance of new wax, used to elongate some of the cells or plastered around in lumps on the combs and frames in the upper part of the hive. Young bees, just before they become field workers, apparently secrete wax readily when they fill themselves with raw nectar, as they do during a good honey flow, and when combs are not needed. Even field bees often have tiny wax scales protruding from their wax pockets when caught as they are working on the flowers.

During more recent years many producers of extracted honey have been cutting deeper into the comb when uncapping. One object of this is the production of wax at but little cost, the theory being that the wax needed to elongate the cells when the combs are given back to the bees would otherwise be wasted during a heavy honey flow especially in colonies having an abundance of young bees of comb-building age. Those who have tried this have not noticed any reduction in the yield, because of the extra wax secured in this way, and no one knows how thin the combs could be shaved down without reducing the yield. Bees will deposit nectar in cells not more than one-eighth inch deep, and then add wax as needed in elongating the cells; while they refuse to draw out foundation, unless the need of more room is imminent.

Under favorable conditions a few frames of foundation mixed with empty combs may be drawn out and filled with no perceptible reduction in the yield; but, if none but frames of foundation are given, the yield is usually considerably reduced. It is apparent, therefore, that the difference in yield of the two types of honey can not be calculated from the number of pounds of honey needed to produce one pound of wax; and, conversely, the number of pounds of honey required to produce a pound of wax can not be computed from the difference in yield between the two types of honey.

Great Variation in Yield Under Different Conditions.

During some seasons the character of the honey flow may be such that practically no comb honey is secured, while in the same locality a fair crop of extracted honey may be produced. Yet in the next season in the same locality the yield of the two types of honey may be nearly equal. In some locations the character of the honey flow is such that the average yield of comb honey during a series of years may be even less than one-half that of extracted honey, while in other locations the average yield of comb honey during a series of years may be 75 or 80 per cent of that of extracted honey; and, finally, under precisely the same conditions as to location and season the beekeeper without skill and experience in comb-honey production will secure less than half the yield in comb honey as compared with extracted honey, while the skilled comb-honey producer may secure nearly as much comb honey as extracted honey.

Undoubtedly, the extra amount of wax secretion necessary in comb-honey production is a factor in reducing the yield; but it is by no means the only one, and under some conditions it becomes of minor importance. The condition of the colonies, the character of the honey flow, and weather conditions may have greater influence on the difference in yield than the secretion of wax and comb-building.

At the close of the honey flow there is usually more honey and less brood in the brood-chamber when comb honey is produced. If there is no later honey flow, this additional honey in the brood-chamber must be considered when comparing the yield with colonies used for producing extracted honey. In addition to this, there are fewer bees to "board" during the late summer. On the other hand, if there is a later honey flow of considerable importance, the greater number of young bees in the colonies used for producing extracted honey may result in a great gain in surplus at the end of the season over those used for comb-honey production. The difference in yield in these cases can not be greatly influenced by wax secretion and comb-building.

Difference in the Spirit with Which Bees Work.

Probably the greatest factor in the causes of the difference in yield of the two types of honey is in the difference in the spirit with which the bees work, and the rapidity with which they expand their activities thruout a large super space when empty combs are given in the supers instead of frames of foundation. It sometimes happens that conditions are such that the work of the colony becomes stagnant even during a good honey flow when comb honey is being produced; but this does not often happen when extracted honey is being produced, if sufficient room is given.

The problem of swarm control is so closely associated with the spirit with which the bees work that it is difficult in some instances to separate these two things. Much of the loss in yield in comb-honey production comes about by some of the colonies being thrown out of condition for best work while preparing to swarm or because of some hitch in the management in the control of swarming. When it becomes necessary for the beekeeper to interfere to prevent the issuing of a swarm, the colony may respond to his treatment by a period of loafing, as if to get even with the "big boss" who presumes to meddle with its private affairs. Thus the skill of the comb-honey producer is sometimes taxed to the limit in controlling swarming and at the same time keeping the bees in the best working mood.

Since most of the conditions which tend to bring on swarming are the same conditions that tend to reduce the spirit with which the bees work, the beekeeper, who by careful management is able to stimulate his colony to work with the greatest possible vigor from the very beginning of the honey flow, not only increases his yield because of better work, but at the same time greatly reduces the tendency to swarm.

It sometimes appears that the spirit with which the bees work is of even greater importance in securing a large yield than the number of workers, and herein, to a great extent, is the key to successful comb-honey production. The beekeeper who can do these things, if located in a region suitable for comb-honey production, will probably produce about as many sections of comb honey per colony as pounds of extracted.

THE VALUE OF PACKAGE BEES

Pays for Equipment First Year Best Time for Receiving Packages

By H. F. Wilson

If you want to increase rapidly and cannot buy full colonies at a fair price, buy package bees — it pays. This is the recommendation which we shall in the future make to the many Wisconsin beekeepers who ask that question. Our experience is limited to two years, and only 115 packages have been used in the tests, but we count the results of as much value as if 1000 packages had been used. If any beekeeper has not had excellent success with package bees, blame everybody and everything but the bees; they were not at fault.

In the March (1920) number of Gleanings the reader will find a first report on 25 two-pound packages, half of them shipped by parcel post and the remainder by express. A final report on that experiment is here given to complete the story.

Starting with 25 two-pound packages in 1919, this number was increased to 31 at the end of the season. At that time these colonies all appeared to have for winter sufficient stores which were supposed to be of good quality. However, dysentery developed during the winter and the losses were quite severe—in fact, so bad that the remaining bees were set out on the 21st of March to get a flight and left out.

Three colonies died out in the cellar, and the others were quite weak or only fair, so that the bees were united on May 1 to form 20 fair-to-good colonies. The actual loss between fall and spring was then 11 colonies, or 30 per cent.

The honey flow for 1920 was very good and provided the finest honey that I have ever seen from clover. The total amount of honey secured in this test can only be estimated, as more than 500 pounds was reserved and given back to the bees in place of dark fall honey. Approximately 1400 pounds of surplus was extracted from 17 colonies. Three colonies for some reason failed to work at all until near the end of the honey flow when they were requeened. Considering the 20 colonies as the unit from which the crop was taken, we have an average of 70 pounds per colony.

It should also be stated that the crop would have been larger except for some experiments in trying to requeen from the top, following the Demaree plan of supering. Raising young queens in the top was found to be very successful, in fact, too successful, except where one is working for increase. The writer was obliged to be away for periods of several days at a time during the summer, and after one of these trips young queens and four to five frames of

Mrs. O. W. Hildreth, assistant secretary Wisconsin State Beekeepers' Association, and her 10 three-pound packages. Mrs. Hildreth paid $165 for her total equipment, and produced more than $160 worth of honey the last season.

brood were found where full supers of honey had previously been. The net result was that honey had been turned into bees, which must be considered in this report.

Twenty-three four-frame nuclei were made from the 20 colonies, and these all built up into strong colonies by fall. The larger part of the honey secured has already been disposed of at 28 cents per pound above the cost of containers, so that the total value of the crop may be figured at 28 cents per pound or $392.00.

The cost for maintenance in 1920 follows:

Sugar for feeding bees	$ 38.00
Wire for frames	2.47
30 hive-bodies with frames and foundation	65.00
Paint for hives	7.00
One uncapping knife	5.00
Cheesecloth	.80
1 galvanized can	1.40
Labor 109 hours at 50 cents per hour	54.50
Total	$174.67
Total cost of apiary for 1919	439.17
Total cost of apiary for 1920	174.67
Total cost	$613.84
Total receipts, 1919	$288.00
Total receipts (estimated for 1920)	392.00
Total receipts	$680.00
Less total cost	613.84
Net return above total cost	$ 66.16
Estimated value of beeyard on Nov. 1, 1920.	
43 colonies of bees at $15.00 per colony*	$645.00
Estimated value of supers, combs, and other equipment	200.00
	$845.00

*Ten of the original colonies were sold for $15.00 per colony, so the figure is set for the lot.

When Package Bees Should Arrive in the North.

In 1920 further tests with 90 packages were not entirely successful from the standpoint of crop production, but from our viewpoint they were quite productive of experimental data.

In order to get some information on the value of having the bees arrive early, we made arrangements to have the bees shipped in three lots; one lot to arrive Apr. 20, a second lot on Apr. 25, and a third lot May 1. We also attempted an experiment with 20 two-pound packages in comparison with three-pound packages, but this experiment was unproductive of real experimental data because of the cold weather which followed the arrival of this lot of bees. Thirty packages arrived on Apr. 20, but cold, cloudy weather greatly interfered with their getting started. Some half-dozen queens arrived dead, and others turned out to be drone-layers, so that it was impossible to make comparisons. The second lot, made up entirely of three-pound packages, arrived on Apr. 26, while the weather was still cold and after holding one day they were put into hives with combs of honey. The cold weather again interfered with the bees' getting a start, and, as there were seven dead queens and 22 drone-layers in these first two lots, the only thing we were able to do was to unite many of the packages and thus break up any comparisons which we might have made as to crop production. The third lot of 30 packages arrived May 1; 15 were placed on foundation, and the others on combs of honey.

From the lot received on May 1, 10 packages placed on full sheets of foundation and given sugar syrup in Alexander feeders were disposed of to the young lady in the accompanying picture. A record of this yard is included.

At that time the temperature was high enough so that the bees were able to go to work at once building comb, and they built up in good condition. By the first of July they were so strong that it was impossible to prevent swarming in all cases, and one colony was greatly reduced by losing a swarm.

The total cost for this apiary including hives, supers, foundation, and 100 pounds of sugar was $165.00.

More than than 500 pounds of surplus was received, which was sold in two, five, and ten pound pails at 35 cents per pound, netting the producer an average of 32 to 33 cents per pound, or $160.50. In addition, one 60-pound can including the cappings was preserved for home use. This record shows quite clearly what might have been secured from the other packages received on Apr. 20 and Apr. 26, if they had been delayed until May 1.

From this series of tests we have arrived at the following conclusions:

1. While package bees may be received in April with good success, the weather is likely to be too cold for the bees to build up, and there is great danger that the queens will arrive dead or that the cold will affect the queens so that they can only lay drone eggs. In other words, exposure to cold seems to destroy the power of the queen to lay fertile eggs.

The loss of queens and the damage to others in our case are laid to the fact that the queen cages were hung too low, and that when the bees clustered the cages hung below the cluster and were exposed. The attendant bees in the cages were unable to keep the temperature high enough for the proper transportation of the queen.

2. Package bees should be received in Wisconsin about May 1 and not later than May 10 to be of value for the average season's honey flow.

3. Nothing less than two-pound packages should be secured.

4. Full drawn combs with honey and pollen are better than full sheets of foundation, but the bees should be fed sugar syrup for a few days when combs of honey are used.

BEEKEEPING IN FOREIGN LANDS

Spring Dwindling in the Tropics Requeening and Other Things in the Dominican Republic

By E. L. Sechrist

SOME good people think that every season is summer in the tropics and that bees gather honey every day. Sometimes that is true — then again it is not, and with a vengeance. For instance, you never saw bees so anxious to rob as they are here sometimes during the months of drouth, during the broodless period when the bees can fly every day, and must fly and carry water to evaporate in the hive to cool it. In some places water may be so far away that it is wise to bring it to the apiary to prevent undue wear and tear of the bees. The usual method is to carry water on the back of the patient burro in the ever useful empty gasoline tins in palm-leaf bags. Often a woman and child will be perched on top of all. If it were not for the burro and the Ford—the two conveyances of the common man, Dominican for the burro and Americano for the Ford —beekeeping would have troublous times in this country. The burros also draw the honey to market, either in tins, or in barrels, on a two-wheeled cart drawn by three burros or one mule and two burros. Occasionally there is an ox-cart.

The Winter Problem in the Tropics.

This continual flying of the bees during the "winter" season of August, September, October, and often part of November (especially if there has been a June and July drouth stopping brood-rearing early, so that colonies would go into "winter quarters" with few young bees) results in the "nicest" cases of spring dwindling you ever dreamed of. There may be left, when brood-rearing begins, quite a respectable number of bees in a hive and a good lot of brood will be started. Then the worn-out bees begin to die, and before enough young bees have emerged to replace the old ones, the colony may have dwindled to about a two-frame nucleus with more hatching brood than the bees can cover—poor, chilled youngsters hardly able to emerge.

In a Dominican apiary.

Brood Scattered Thruout the Hives.

Bees follow the same program here as elsewhere, but the results are somewhat different. This is quite noticeable in the laying of the queen. Here, temperature does not often compel the bees to keep the brood-nest compact, so often the queen may lay a patch of eggs in the outside of the outside comb as the place most free from intrusive honey. As usual, the incoming bees deposit the nectar in any empty cell in the first combs they find. As they are not compelled to move it from that spot in order to keep the brood-nest compact, only too often it is left right there and sealed, and the queen lays wherever there is a vacant spot. Frequently there is brood to equal three or four frames scattered over ten, and often into the second story unless the queen is kept below by an excluder. A two-story brood-chamber would be very desirable, but the bees do not seem to know how to use it, not being compelled to use it as they do in the colder northland. The poor queen is at her wits' end to know where to put eggs. If an empty worker comb is put in the middle of the brood-nest, it is ten chances to one that the queen will be busy filling some few vacated cells in some other comb, and the pesky workers will fill that new comb full of honey before the queen discovers it. She is sometimes able to get some eggs into the bottom one or two inches of the comb, but often it is solid full of honey, and the bees do not move it—don't have to, so why should they? Foundation fares slightly better.

Apiary "Sabalo" house is of palm and is palm-thatched.

Never, anywhere, have I seen such a great loss of laying queens as in our apiaries here —I'm not quite sure why, but one reason is that queens are ordinarily reared in three-frame nuclei, thus resulting in small poor queens, of course.

Advantages of the Side-Nucleus.

I am using, with a good deal of pleasure, some "side-nuclei"; viz., a three-frame nucleus attached to the side of the regular hive, and with an auger hole entrance at the rear and a double zinc-covered auger hole connecting the nucleus with the mother hive. Here I can have a young laying queen ready to replace a lost one in the mother hive; or the whole three combs with bees and queens may be shifted to a new location to be built up into a full colony, while the returning old bees and others that will enter the empty side-nucleus thru the connecting zinc will care for new combs of sealed brood and a cell replacing the frames taken out to form the new colony. There is never any lack of bees to care for the brood in the side-nucleus and any surplus bees reared there can find their way into the main hive. In this way young queens may always be ready, so far as I can see without any loss to the working force of the apiary and with little disturbance of the producing colonies.

This side-nucleus may be examined without interfering with the mother colony, and if a young queen should be lost in her mating flight, there is no dwindling nucleus with laying workers; but the workers simply move into the main hive, a few staying there to care for the combs, even filling them with honey. Nor have I seen any of these nuclei robbed out, since they are defended as a part of the main colony.

This side-nucleus plan gets rid of another trouble we have with weak colonies or nuclei—the bothering by ants until they swarm out. In one apiary this spring (not ours) I saw 30 small colonies so pestered by ants that they swarmed out at the same time and tried to get into one single-story colony. It became a strong colony, to say the least, but two weeks later most of those bees had died and there was only a weak colony left.

A Dominican "barrile," used on the side as shown and the combs cut from half the length.

In Poor Condition for Honey Flow.

So it isn't all play beekeeping in the tropics, and we must find how to manage those instincts or actions common to bees in all lands so that we may have the best results here. Ordinarily, not half the colonies are producing honey on account of some of these occurrences that throw them out of normal: A crowded brood-chamber and little brood; a poor queen or one missing at a critical time; a colony swarming because of being honey-bound or because young queens emerge after the old one is lost; or colonies badly weakened by spring dwindling—yes, and how the moths do like to get into these two or three stories of combs that were the home of a big colony at the end of the honey season, but which later dwindled to a handful.

Why not remove those combs when the colony becomes weak? Very good, but to break the sealing of a hive, especially a weak one, during the robbing season, even if it is done in the evening almost at dark, will almost surely precipitate a robbing furor next morning, not only of the colonies handled, but also of every colony in the yard. Each will be thoroly investigated and no weak one will escape. It surely is the survival of the strong.

Side-nucleus especially advantageous during the robbing season.

This ''locality'' business sometimes seems to be a bit of a joke; but, believe me, differing conditions do require adjusting of methods. Where bees fly and rob all ''winter,'' one has a different problem from that where the good little bees keep their nicely packed hives at the proper temperature of 57 degrees all those chilly months. Some days I have longed for a big refrigerator, big enough to chuck in a whole apiary.

Crude Equipment Used by Natives.

These Dominican ''barriles'' are used lying on the side and not standing on end as is usual with log ''gums.'' The new combs built in one end of the log are cut out annually or oftener and the honey pressed out, a considerable quantity of honey being obtained in that way. The drouths of the last few years in this region around Monte Cristi, have wiped out many of these native apiaries, also causing great loss among bees in modern hives, and many beekeepers are much discouraged.

Usually the apiarist and his family live in a small house near the honey-house—sometimes even in the honey-house; and their acquaintance with the bees becomes very intimate, especially at extracting time, when the little brown-skinned, nude youngsters become so honey-covered inside and out, and so disgusted with the occasional bee that becomes entangled in their curly, often kinky black hair, that the mother gathers her brood together and retreats to some neighbor's, where there are no bees, until the excitement is over.

Of course, during the extracting time, there is plenty of honey and cappings all around, and the near-by neighbors and their children come in and help a little, or get in the way and eat what honey they want and carry away a little in a bottle; but one is quite willing to have them do that, since it results in their almost never taking any honey from the hives, as might be expected. There little stealing here.

Our apiary houses and the houses in which the country people live are rather crude, often built of poles with small sticks interwoven and plastered with mud, and with a thatch roof of palm leaves. Some houses are made from palm boards split from the outer shell of some of the palm trees, the inner part of the trunk being fibrous and unfit for use. These houses are more desirable than those of ''wattle-and-daub'' and sometimes have board floors, instead of the usual earth floor. Of course, we plan, some day, to have better equipment and cement stands for the hives (there are some now) instead of the wooden stands or the logs, which so soon are eaten up by the white ants (termites) that also work up into the hives and destroy many unless the bottoms are painted with creosote or carbolineum.

Monte Cristi, Dominican Republic, W. I.

HONEY IN THE SWEET FAMILY

Its Many Relatives and Just What Relation They Are to Each Other

By E. Wynne Boyden

THE general subject of the composition of the sweets is really of considerable interest, and, in spite of what you may think, it is not difficult to understand.

Do you know what honey is? Do you know what glucose is? Corn syrup? Invert sugar? Do you know the difference between cane and beet sugar? Have you encountered these new malt syrups which are trying to compete with honey? Do you know what they are? Do you know why glucose will not do for bee-feeding? Well, that is enough—I could go on, but my purpose is to answer questions rather than ask them. No—more than that. I want to make their answers self-evident. All our sweets are simply combinations of a very few fundamental components. Let me first then give you these fundamentals.

If a food is sweet it must have sugar in it, of course. But do you all know that there is more than one kind of sugar? I do not mean more than one source of sugar. I mean that there are different sugars, just as there are different varieties of grass in a meadow. All grass is somewhat green; all sugars are somewhat sweet, but not equally so. And there are other differences. Now the chemist can name 20 different sugars; but please don't worry, for I will stop at five, because there are only five sugars which are found in foods to any large extent. Try to remember the five when I give them. If you do, you have the key to the whole situation. Here they are:

No. 1 is **Sucrose**, S-u-c-r-o-s-e. It ought to remind you of s-u-g-a-r, ordinary sugar, because ordinary sugar is sucrose, I care not whether it be cane or beet.

No. 2 is **Lactose**. Does the word ''lactose'' suggest milk? It should. Lactose is only slightly sweet, so possibly you do not know that milk always contains a large amount of it. About one-fourth of the solid matter in milk is lactose. It is not found elsewhere, and I mention it only for the sake of completeness.

No. 3 is **Maltose**, Malt-ose. It somehow savors of beer and malt products, doesn't it? Well, so it should, because maltose is is sugar of beer. It is perfectly healthful, too, that is, the maltose is perfectly healthful. Possibly some of you prohibitionists think that maltose is a dead one, but not so. I assure you maltose is found in corn syrup as well as in beer; and there are still other sources.

Now I am ready to give No. 4 and No. 5, and I want you to pay especial attention to these last, for here we are coming close home.

No. 4 is **Dextrose**, and

No. 5 is **Levulose**. I name them together because they are usually found together. In honey, for instance, they share the honors about fifty-fifty.

Now I am wondering whether you remember these five sugars and can name them.

No. 1: Sucrose, cane or beet sugar.
No. 2: Lactose, milk sugar.
No. 3: Maltose, ''beer'' sugar.
No. 4: Dextrose }
No. 5: Levulose } in honey and fruits.

I must say a little more about **dextrose** and **levulose**. They are favorites of ours anyway, for what would honey be without them? Dextrose is also found in grapes; hence it is sometimes called **grape sugar**, a product of which I know you have heard. Furthermore, dextrose is found to a small extent in commercial glucose or corn syrup, hence it is sometimes known as **glucose**. This is unfortunate, because it leads to confusion; but we must accept the three names, and do our best to remember them.

Now, do you get the situation clearly? **Dextrose**, our No. 4 sugar, is sometimes known as **grape sugar**, and sometimes as glucose. But don't confuse it with commercial "**glucose**" or corn syrup, which has maltose and other constituents in it as well as dextrose.

Levulose, our No. 5 sugar, also has a few claims to distinction. I told you that it was found in honey. It is found in fruits as well. It is found in so many fruits, in fact, that some busybody decided to give it a new name, **fructose**. Remember that our No. 5 sugar, levulose, is also called **fructose**. Here is an interesting thing about levulose; it is the sweetest of the five sugars. It is fortunate for us that this is true, for if it were not for the levulose in honey, our favorite sweet would hardly deserve to be called a "sweet," as dextrose, the other honey sugar, is not very sweet. I would like to let each of you have some levulose for sweetening your coffee; but, at last quotation, the stuff cost $50.00 a pound, and—well, I keep my supply in the safe.

Some Secrets of the Sugars.

I hope that you have not forgotten our five sugars. They constitute an interesting family, and furthermore, a chemist can tell you a few family secrets. Suppose, for instance, that we found two particles of dextrose—I said particles of dextrose, but I would like to say *molecules* of dextrose. A molecule is merely an extremely minute particle, you know. A molecule of sugar is the smallest possible unit that you can get and still have the sugar. If you try to go farther yet and break the molecule into pieces you get not sugar, but carbon, hydrogen, and oxygen. But I am disgressing. You know what a molecule is, I am sure, and, as I was saying, suppose we have found two molecules of **dextrose** in combination. What would we call the pair? Would we say that we had two molecules of dextrose? Not by any means; we would call the pair **one molecule** of **maltose.** Maltose? Why that is our No. 3 sugar! Do you see the point? The combination of two molecules of dextrose is called maltose. Suppose I had some maltose and wanted some dextrose. Could I split the maltose molecules in two, and have **dextrose?** Certainly; I will tell you how in a minute. But let me first make this matter of the union of the molecules a little clearer. Forget chemistry for a minute and imagine yourself in your apiary. You have before you two single-story hives. You want instead one double-story hive. Now, of course, you simply place one hive-body on top of the other. But when you get done you have an extra cover, do you not? In the same way when two molecules of sugar are united there is left over an "extra cover," so to speak. When two molecules of dextrose unite to form one molecule of maltose, this "extra cover" is a molecule of water. And when we split the maltose molecule apart again we must give back this extra molecule of water or the whole business will fly to pieces. I am sure you understand—clumsy as has been my explanation. Now we can go a step farther—a beekeeper doesn't always stop with a two-story hive, and neither do we have to stop with two molecules of dextrose. Let us suppose we have not two but two hundred molecules of dextrose in combination. What would we call this conglomeration? We would call it starch, cornstarch, potato starch, or almost any kind of starch. Did you know before that starch is a mere conglomeration of dextrose molecules? Now could we break up one of these giant starch conglomerates? Yes, we can do it, and let me tell you how to go about it. Take some starch, boil it up with water to make a thick paste, and then add a trace of acid. The acid "coaxes" the conglomerate of dextrose molecules to fall apart, so we call it a "coaxer." The chemist would call it a **catalyst.** Now when we have boiled our starch paste for an hour or more with this trace of acid, we find that it has changed considerably—it has become sweet. The big conglomerate of dextrose molecules has broken down, but not completely. There are still some small groups unbroken. Here we find a bunch of about 40 dextrose molecules still hanging together. What is it called? It is not starch, and it is not dextrose, but we may call it dextrine. Dextrine is the gummy substances on the back of postage stamps.

What Relation Is Commercial Glucose?

About half of the original starch is left as dextrine; the remainder has broken down farther, and so we find a number of groups of two dextrose molecules, this being the maltose. The rest has gone completely to single molecules, and is dextrose. Thus we have a mixture of about one-half dextrine, one-fourth maltose, and one-fourth dextrose. What shall we call this product? It is none other than our former acquaintance, commercial "glucose," or corn syrup. Did you think that corn syrup as made is a concentrated extract of the sweetness of the cornstalk? Banish the idea. Corn syrup is made from starch, usually cornstarch, and that is the only reason it is called corn syrup. Potato starch would do as well.

Now why is it that commercial corn syrup or glucose is impossible as a bee-feed? Simply because of the dextrine, the gummy substance, which is in it. Bees cannot digest dextrine. This also explains why honeydew honeys are poor for wintering—they contain rather large amounts of dextrine, while normal honey has less than one per cent. Note that I did **not** condemn dextrine as a food for human beings; dextrine is perfectly good food for us. And thus on these grounds, we cannot condemn corn syrup or glucose as a food product. I do not say that corn syrup is a perfect food, but I see no fault in it that cane or beet sugar does not possess. Let us give credit where credit is due. Later on, I can show you why honey is a better food.

Well, you see that I have told you a family secret of the sugar family; you see the relationship between dextrose and maltose and dextrine and starch. You know that maltose is merely a combination of two molecules of dextrose minus a molecule of water, that dextrine is merely a combination of 30 or 40 dextrose molecules minus the same number of molecules of water, and that starch is merely a combination of about 200 dextrose molecules minus the same number of molecules of water. Also, you see that we can take the larger aggregates and break them down, thus getting sugar from starch. But do not think that we can as easily reverse the process, and build up a conglomerate. That is almost out of the question.

Honey's Near Relative.

There is just one more family secret, I must reveal to you. Let us take, this time, one molecule of dextrose and one molecule of levulose and imagine them to combine, with the customary loss of a molecule of water in the process. Note that I did not say that I **could** combine these two molecules—in fact, no one has ever succeeded in doing it—but let us imagine that they are combined. What have we? We have one molecule of sucrose, our No. 1 sugar, which is ordinary cane or beet sugar. Now we are able to break this molecule in two, and obtain one molecule each of dextrose and levulose. Just a little acid and hot water will do the trick. What shall we call the product, which consists of equal parts of dextrose and levulose? It is the well-known **invert sugar.** Perhaps some of you may think that invert sugar is about the same as honey, since both are composed mainly of dextrose and levolose in equal proportions. **About** the same they are, but not by any means identical. And this brings me to a discussion of the merits of honey.

Why Honey Excels Other Sweets.

You already know that honey is a mixture of dextrose and levulose in nearly equal proportions. In addition, honey contains a small amount less than eight per cent of sucrose, ordinary sugar. These three sugars, with about 17 per cent of water, constitute more than 9/10 of honey. But the remainder, small as it is, is nevertheless highly important, and serves to lift honey above the other sweets in food value.

What is the remainder? First, there is mineral matter; every mineral in the human body is present in honey. Of course, we need mineral matter in our food, and we need more than the present generation usually gets. We need calcium and phosphorus for our bones and teeth, and iron, sodium, potassium, calcium, etc., in the blood; not to mention many others required by various organs of the body. Common sense would tell us if science did not, that what mineral matter we get we must get in our food. And yet, what do we do to our food products? We refine them so much that they are greatly demineralized. I am not an alarmist, but I stand ready to prove that we have reached a danger point in this elimination of minerals from our foods. Consider, for instance, white granulated sugar. It is 99.9 per cent pure sucrose if it is cane sugar; beet sugar differs only in that it is about 99.6 per cent pure sucrose. Where is there any room for voluble mineral salts? We must concede that the great fault of ordinary granulated sugar is its purity, strange as it may sound. Brown sugars have some ash, and are therefore better, altho the assortment of minerals is far from perfect. Old-fashioned cane syrup is very much ahead of refined sugar in this respect, and so is maple syrup, which, I might remark, is composed of sucrose with a small percentage of mineral salts and organic substance. These last give maple syrup its flavor, and incidentally make it more healthful. However, maple syrup and cane syrup are all too rare and ordinary sugar is conspicuously lacking in this matter of mineral salts. What about molasses? This product has too much ash, strange as that may seem. The ash is, however, mostly the lime that was added during the sugar refining. Present-day molasses is not a very wholesome food product. Corn syrup and glucose have a little mineral matter, but unfortunately it is mostly common salt, introduced in the process of manufacture, and common salt is never lacking anyway. Thus we see that honey stands alone in this highly important phase of food value.

There is one other respect in which honey excels, and those of you who have been reading "Gleanings in Bee Culture" will know to what I refer. It is in regard to the vitamines in honey. It has recently been proved by scientific research that honey does contain vitamines, especially comb honey. I will not take time to tell you about vitamines; everybody is hearing about them nowadays, and everybody has come to realize that they are essential to life and health. But, as in the case of mineral salts, refined foods are apt to be lacking in vitamines. Even heat will often destroy them, and it is partly for this reason that none of the commercial sweets except honey contain them.

Thus we see that there are at least two respects in which honey clearly excels all the other sweets. There are many little details I could give you which would increase your appreciation of honey, but this discourse has undoubtedly lasted long enough already, and I will close by urging you to study all the sweets in order that you may have a clearer understanding of the merits of each one.

FROM THE FIELD OF EXPERIENCE

MAKING OF HONEY A STAPLE

Importance of Advertising Backed up by a Constant Supply

Notwithstanding the price-fixing and all other attempts to stabilize the prices of food materials, just how well the Government succeeded and how the prices flew skyward when Government control was removed, is an old story. Now the reaction is on, and it is very hard to say how low the prices will go. It is, however, a matter of great importance to the honey producer to keep the advantage gained during war time.

As with other foods, the price of honey is bound to fall; but what difference does it make if the relative price-ratio and demand can be held? The honey producer can do but little to maintain the ratio, so it is on creating a larger demand that he must rely for his future.

During the war period the publicity given by the Bureau of Entomology at Washington and the States Relation Service gave to the use of honey an impetus that must not only be maintained, but augmented. How to do this is now the producers' most vital problem. A study of the manner in which other commodities have been made popular is of intense value. The same devices used by the growers of oranges, prunes, raisins, or walnuts will do the same for honey as they have done for these articles. The devices can be included under the following heads: Marketing associations, advertising, and a constant and easily accessible supply. To have all the publicity possible and have a honey advertisement as familiar as that of Camel cigarettes, and not have honey where the buyer can get it will never create a trade. A housewife sees an advertisement and telephones her grocer the order for honey. She is pleased with her purchase and a month later repeats the order. The grocer informs her no honey can be had, and she substitutes a corn syrup. A sale of honey is lost, and a constant customer becomes the patron of some syrup company because of their attractive advertisement, neat package, and ability to deliver the goods. As centrally located as is St. Louis, Mo., there were only a few stores where honey could be purchased during the summer of 1920.

If a constant and accessible supply then is the keynote of the question, how can it be obtained? The answer can again be taken from the great fruit firms, a nation-wide marketing association. In such hands, advertising of a widespread and efficient character is possible at the least expense to the the marketing association. These advertisements must be written and placed so as to attract the housewife. The advertisements should appear in magazines and papers devoted to the home. At the same time, these papers should receive popular articles on bees and honey from the proper representatives of the marketing association. These advertisements, however, should not be as lavish as those of some firms, as the housewife is the prince of economists, and she argues that, if the association can afford such a high-priced display, there is an immense profit in honey, and she will look for cheaper sweets. There can be but little doubt that a popular magazine article on bees is one of the best salesmen; and, if this is backed by an ad showing where honey can be bought and a constant supply be on hand, you have a regular customer.

A national marketing association's first and greatest problem is to control the supply. It means that, from California to Maine and Florida to Washington, Mexico and Canada included, the beemen thru their representatives must pool their issues and allow the central officers so to direct the sale of honey that no lack of honey exists on the market. Not only must they supply regularly the established trade, but they must make it possible for stores to handle honey as they do other standard goods.

The American Honey Producers' League, which was inaugurated last winter, plans to do just this kind of work. Based as it is on the experience of the Colorado, California, Texas, and other state associations and backed by a majority of the beekeepers of the honey-producing States, this league can and will solve these problems.

College Station, Tex. H. B. Parks.

* * *

UNDUE SWARMING IN ENGLAND

How the Character of the Honey Flow Influences Swarming

On reviewing the peculiarities of the present disastrous honey season three points are prominent: (1) The entire absence of a normal spring flow; (2) a long and heavy swarming season; and (3) scarcity of autumn stores for wintering. Without doubt 1920 has produced the scantiest honey crop for some years; and, in fact, in most localities it has been a total failure. During the period of fruit blossom the weather was more or less cool and windy, and instead of the usual surplus of honey from beans, sycamore, raspberry, etc., many colonies had to be fed in order to avoid a check in brood-raising.

Altho prospects for the main honey flow were fairly bright, the midday temperature was too low, and the nights were too cool for clover to yield any appreciable amount of honey, and but little work was done in supers.

To the light interrupted flow during June and the drenching July, with one-half day in three fair to fine, must be laid the cause of the tremendous swarming reported by all beekeepers this summer. It is well known that during a hot summer, if near fields of white Dutch clover, sainfoin, or lime groves, strong colonies will fill super after super without attempting to swarm more than perhaps once. But this year, when prevented from working in the fields, bees developed instead the swarming fever. Many swarmed four to six times; indeed, the number of swarms which flew away must be very large because far more issued than the beekeepers had hives for or were able to deal with properly. Skeppists had more swarms and casts than they had straw skeps to place them in, and in one village I am acquainted with, the bee stock in the church tower threw so many swarms that practically every one from the postman downwards finished up with a stock in his garden. No surplus could possibly be stored after such excessive swarming. Strong colonies became weak, and the brood-combs were practically empty of stores. Several cases of starvation were noticed in August. Feeding has therefore had to be carried out on a large scale, 15 to 20 pounds of sugar being required by practically all stocks to carry them over till April next. Generally three or four light stocks were united to form one strong colony before feeding was proceeded with.

The failure of the honey crop added many difficulties to the work of the queen-breeder. In my own apiary nuclei were found to be in constant danger of starvation because, altho strong in bees, they were not able to forage and thus become self-supporting. Queen-mating was also restricted and uncertain. In ordinary seasons nuclei should be able to produce two queens per month for June, July, and August; but, owing to the abnormal length of time taken between the dates of emerging and mating of queens, not more than two queens every six weeks could be removed, whilst the number lost was rather higher than usual. The restricted mating weather resulted in a fair percentage of pure matings from drones bred in the apiary; but, on the other hand, the cool summer temperature had the effect of darkening the color of queens bred from light Italian stock. Light queens are never so bright as when raised during hot weather while a flow is in progress.

The net result of the season is that comb honey is almost unknown, and extracted honey, tho fair in quality, is exceedingly short. The country is well stocked with bees, and disease appears to be rather on the decline. As sugar stores are not so safe a winter food as honey, wintering cannot be up to the average. Strong stocks formed by mating weak lots together are likely to winter in fair shape. Weak stocks are almost sure to die out, and a heavy loss in this direction is more than likely.

Cheltenham, England. A. H. Bowen.

Mr. Admire's apiary, shaded by castor bean plants, with the lower leaves trimmed away.

FROM THE FIELD OF EXPERIENCE

AN ARTISTIC NATURAL SHADE

Inexpensive Method of Shading Bees When Shade is Most Needed

I own a tract of land containing about two acres. On these two acres I keep my wife and seven children, rather a small family for such a large farm. On this same plot I also have from 25 to 50 chickens and raise plenty of vegetables for the family, with quite a few to sell. Most of the ground outside of the chicken park and where the house stands is planted to some kind of vegetables. On this two-acre tract and located nearly in the center of the garden are 40 families of bees.

When I thought of placing my bees out in the garden among the vegetables the first thing was to provide some kind of shade. I finally thought it would do a double duty to plant castor beans, as they would provide shade for the bees and keep the moles from rooting the ground all up. At least Grandma used to say if you planted castor beans in the garden moles wouldn't bother. Well, I found this wasn't true. There were two or three moles that just seemed to delight in staying right in among those hives all summer. Maybe the reason was that they liked the bees better than the beans, but any way I am not going to be so sure about what Grandma says hereafter.

As for the shade I don't think you could find anything nicer and more efficient. The picture where you can hardly see the hives because of the beans was taken July 2, and the others were taken September 1. As the beans grow I trim out the leaves underneath, and by the hottest part of the season the plants are tall enough to let plenty of air thru and they have a nice umbrella-like foliage, so they make an ideal shade. There is another feature that is worth something to me, and that is that, if you use a little judgment in planting, you will add greatly to the beauty of your yard and in my case to the garden. The bees seem to be well pleased with their surroundings, and it seemed as tho some of them tried to keep the top of their house above the top of the beans; but, after some had erected seven stories above the ground floor, material seemed to get scarce, and, as the beans were gaining on them all the time, they gave up in despair. I had a hive with seven comb-honey supers on just coming up to the first limbs of the shade, so trimmed as to make the height right. Some of these beans got 10 feet high and 6½ inches thru at the ground. It made a regular grove for the bees. I had beemen from all over our part of the country come to see them. I live right on one of the main highways thru Nebraska, and this yard certainly attracted the attention of lots of passers-by.

To sum it all up, the castor bean comes up in the spring and does not bother when the bees need all the sunshine and warmth they can get. As the weather grows warmer, the beans come on and and make the necessary shade. Then in the fall when the bees need the sun again the beans are killed by frost and cut and taken out of the way. And for the amount of trouble taking care of them, I don't believe there is any kind of an arrangement that will equal them.

Auburn, Nebr. J. W. Admire.

Here are the castor bean plants before being trimmed, early in July. The shade is abundant.

FROM THE FIELD OF EXPERIENCE

THE BEDELL CAPPING PRESS

An Extensive Producer Favors Pressing the Cappings

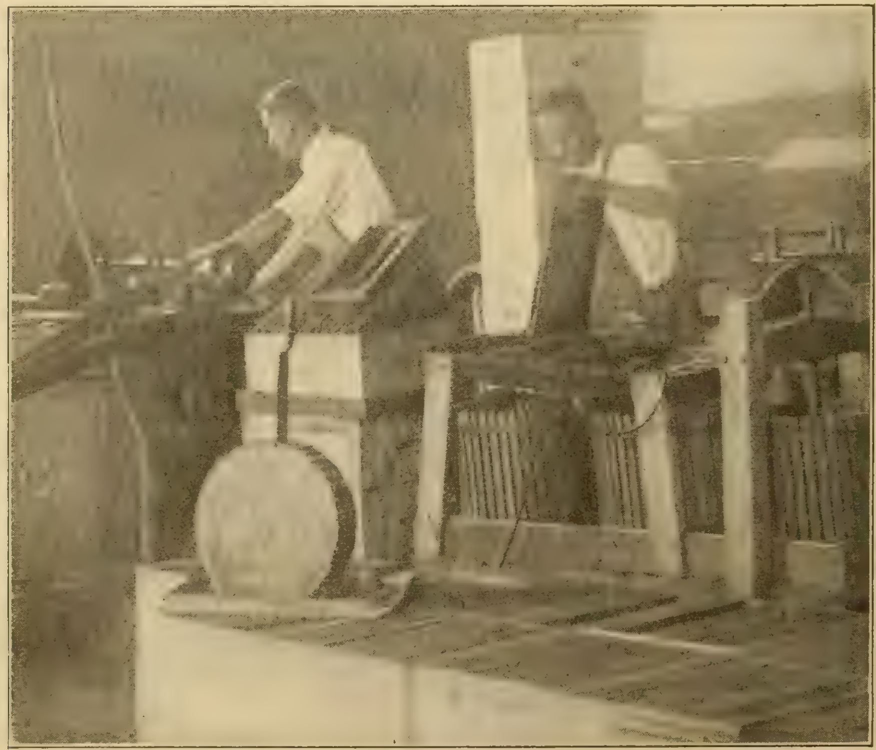
During a course of lectures for commercial beekeepers given at Cornell University it was my good fortune to meet O. W. Bedell of Earlsville, N. Y. He there put before me a press devised by him, to press the honey out of the cappings, which have been cut from the extracting combs. He also showed me a sample of the cappings after pressing. I was so impressed with the process that I wrote an article for the July number of Gleanings for 1919, giving illustrations describing the machine and how to use it. From the number of inquiries which have been received from readers of Gleanings, I know that Mr. Bedell's press has made a wide and favorable impression. The accompanying illustration shows the machine in use. It has proved all that I expected it would. Two men can uncap at this machine, and at the same time a ''cheese'' can be in the process of pressing.

One of the cheeses will be seen turned on its side with the point of a honey knife embedded in it, showing its solid nature. So well had the honey been pressed out of the cappings that, altho half a dozen of these cheeses were piled on a sheet of paper for several days, practically no honey ran from them. There is no question about the thorough success of this method of removing the honey from the cappings, and it has given probably 1,000 pounds of honey in its best condition for immediate sale.

When I secured this extracting-house we secured the best facilities we ever had for extracting. It has water, sewage, and gas connection. We can run our truck right into the building. As the honey is extracted, it is warmed, by means of the gas.

The building (formerly a church) has room to carry on all operations and store 10,000 extracting supers. We were told the robber bees would drive us out, and as the building is on the main street of the town robbing would have been serious. Particularly dangerous was the situation as the honey was buckwheat; but no disturbance was created, and some 15,000 pounds of buckwheat honey was extracted and filled into tins without inconveniencing anyone. A little crude carbolic acid was used about the entrance door. R. F. Holtermann.

Brantford, Can.



The Bedell capping press in operation.

SIFTINGS

J. E. Crane

I BELIEVE there are a good many beekeepers who would look just as good-natured as W. J. Harvey does on page 743, December Gleanings, if they could produce 908 pounds of honey from one colony, or an average of 360 pounds for four years from their entire yard.

* * *

That old term "quiescence," page 714, is a most decidedly good one and should be in more common use than it has been, for it sums up in one word the problem of successful wintering.

* * *

That was a right good article, by Penn G. Snyder, on "Beekeeping in Porto Rico." For one I have often wished to know the conditions in Porto Rico, and the facts he gives just satisfies my curiosity. It was almost as good as a visit to the island. I am glad we are to hear from other far-away lands.

* * *

The editorial on page 713 says, "The danger of the entrance being closed by dead bees and the condensation of moisture within the hive are both greatly reduced by winter protection." Quite true, but the danger of entrances getting closed is greatly increased by a poor quality of winter stores.

* * *

The report referred to by H. B. Parks, page 739, and taken from a bulletin of the Colorado Agricultural Station, by Dr. Walter G. Sackett, on the danger of contracting bacterial diseases from the use of honey, shows the danger to be less than has sometimes been supposed—much less, in fact, than from "water, milk, or other substances of high water content." The fact that the bacteria Dr. Sackett tested could live only from two to four days in extracted honey shows that it is very difficult, if not impossible, to contract any of those diseases from honey.

* * *

I had planned for some time to say, in January Gleanings, something about the "Production of Comb Honey," but I see the new editor has got the start of me. However, notwithstanding my timid nature, I believe I will not be frightened out of what I intended to say. All Mr. Demuth has said is quite true, but there are some things he has not said. The price of supplies for comb honey at the present time makes its production seem rather unattractive. The price of sections, foundation, cartons, shipping-cases, and crates will be somewhere from seven to ten cents for each section to start with; and then the work of making all the sections, putting in starters, setting up shipping cases, cleaning, and weighing each section, and then making crates, and packing will be no small task—to say nothing of the extra work of caring for yards run for comb honey. We have produced comb honey in the past and shall doubtless continue to do so in the future, but the high prices of supplies have set us to thinking "right smart."

* * *

That new apicultural building of the Ontario Agricultural College at Guelph, Ontario, illustrated on page 725, is most creditable to the enterprise and good sense of our Canadian brethren. We think the beekeeping interests of the country move slowly, but it almost takes away our breath when we stop to think how few years it has been since an agricultural college first made beekeeping a part of its regular course, or since buildings adapted to this work were erected. Certainly the beekeeping interests of the country never looked more hopeful or more promising than today.

* * *

J. L. Byer, on page 741, writes of finding two queens in one hive. This certainly sometimes happens, as also that bees remove an egg from one comb to another. I have met with both these facts in my experience. This shows very conclusively that nature's rules are subject to exceptions, or rather, perhaps I should say, that in every generation of plant or animal life there is more or less variation. We are not apt to notice slight changes, but large ones we do notice. Some of our choicest fruits and flowers and our finest domestic animals and plants come in just this way. Notice what a sensation that precocious youngster, "annual sweet clover," is producing in the world today.

* * *

On page 730, W. E. Joor tells us how he would maintain good prices by judiciously distributing honey and advertising. His plan seems not only legitimate but feasible. It is only as honey is brought to the attention of consumers that we can expect them to buy and use it. He proposes that the American Honey Producers' League assess its members one or two cents for each hive owned by members. Two or three things seem evident. A large amount of money is needed for advertising. Very few beekeepers are likely to advertise on their own account. There is not likely to be any better organization of beekeepers for this purpose than the American Honey Producers' League.

OUR FOOD PAGE

CONSTANCE ROOT BOYDEN
(Stancy Puerden)

AFTER the articles on Vitamines in the September and October issues a cautious adviser expressed the fear that I might be going too deeply into a subject which most of the readers could not understand and in which they lacked interest. If the number of letters from subscribers are a measure of an article's popularity, then I have no doubt as to the advisability of discussing vitamines. Only one of my other subjects has brought so many letters, and some of these letters make me feel dubious for fear my little articles are not scientific enough for the very intelligent readers of Gleanings. A number of letters have come from the various state agricultural experiment stations, which leads me to hope that further feeding experiments may be conducted by scientific investigators who are themselves interested in bee culture and the production of honey. There is much yet to learn about vitamines in honey.

A year ago last summer, before any research work had been done by Prof. Hawk on honey, I learned what I ought to have known before, that there is more or less pollen dust in honey. Thereupon I advanced the theory that there might be the fat-soluble vitamine in honey, for it seemed reasonable to me to assume that it would be in the pollen, a natural food for the bees. But my husband, my son, who is an enthusiastic undergraduate chemist, my brother, and the consulting chemist of our company rather squelched me. Possibly they thought the amount of pollen dust was too minute to be considered; they hated to admit that pollen dust was in honey at all, or they did not think pollen likely to contain the fat-soluble vitamine.

Later, when Prof. Hawk found distinct amounts of the fat-soluble vitamine in comb honey I still secretly believed it might be due to the pollen in the honey. As I have said before, it is unreasonable to suppose that Nature would waste such a valuable food constituent in the container of the food. And now comes a letter from R. F. Holtermann of Canada, who is both a well-informed and practical beekeeper, with the same theory, and altho we may both be wrong I will quote briefly from his letter:

"In reference to vitamines in comb or extracted honey, will you allow me to make a guess? It is that the vitamines will be found in the pollen, and that there will be found as many and more of them in pollen as in any available food. More—the time may come when pollen in nice new comb will be in great demand where health would indicate the advisability of such."

A few days ago I received an S. O. S. call from a distracted young office man. In his enthusiasm for honey he had written a wholesale grocery firm that it had recently been demonstrated that there were distinct amounts of vitamines in comb honey. The firm wrote back: "The information in your letter is interesting, but what are vitamines?"

But the fame of vitamines is rapidly spreading, as the following quotation from the December number of a popular women's magazine will prove: "As for the detective, he should be as inscrutable as a vitamine."

SOME of you who were interested in the articles, "An Hour With Luther Burbank" and "More About Luther Burbank" last summer may recall that Mr. Burbank promised me a box of spineless cactus fruit in the fall and two of the wonderful, fast-growing walnut trees, and perhaps you wondered at the time if he would remember his promise. You know many of us nowadays excuse ourselves for our failure to answer letters and attend to other duties on the ground that we are so busy that we simply cannot do everything. Mr. Burbank impressed me as the busiest man I ever met, and I know some frightfully busy ones, including the man nearest related to me; but this quotation from Mr. Burbank's letter of Nov. 4 illustrates how this busiest of men remembers his promises, and I had not written him a word to remind him either: "We will send the two walnut trees promised as soon as we can dig and pack them."

And a further quotation as to the fruit is: "I am sending a box of eight or ten varieties of the cactus fruit, tho we could not, of course, send the thin-skinned, tender, most delicious ones, as they are too soft and some of them ripen much earlier than these, and some much later, in fact, all the fall and winter. You will notice that for most of these the big seeds have been reduced to the size of tomato seeds, and you will notice the varied flavors of the different ones, even tho picked before they were quite ripe. * * * * I have now 600 varieties of every flavor, color, form, and size that the imagination could well suggest."

Mr. Burbank at the same time sent a box of the fruit to my father in Bradentown, Fla.; but like the enthusiastic, eighty-year-old boy that he is, father prolonged the pleasures of his automobile trip to that place by going out of his way and did not reach there until the day before Thanksgiving. I imagine therefore that the fruit was spoiled before he saw it.

My box followed the letter within a few days and was in very good condition. How I wish I could have treated every one of you to a sight of it and also a slice. Each fruit was wrapped in tissue paper and packed in fine sawdust. They were smooth-skinned, varying in color from pale green thru green flushed delicately with rose, yellow, amber, salmon rose to some that were a beautiful, clear dark red, just the shade of a Jacquiminot rose. They were exquisite, and, unlike many other beautifully colored fruits, the flesh was intensely and evenly colored clear thru; in fact, the coloring was richer in the flesh than in the skin.

I believe I tried to tell you something about the taste of the cactus fruits after eating those in Santa Rosa last February, but Mr. Burbank explained that they were not ripe at the time, and that was why he wished us to taste them in the fall. Being unripe they did not show the gorgeous colorings at that time either.

The very deep red ones evidently are more delicate than the others, for two were a soft mass and quite spoiled when they arrived; but one was just dead-ripe, juicy, rich-flavored, and luscious. It was so beautiful I couldn't bear to eat it, but so tempting-looking I couldn't help it.

While there were differences in the flavors of the various colored fruits all the ripe ones were fine, and some that were unripe became mellow and sweet after a few days. To some people the flavor of these cactus fruits suggests the banana, the pineapple, or the apricot, or perhaps a blend of all of them. To me it is more like a fine muskmelon or the so-called honeydew melon at its best. Strange to say, when the fact that they will grow in a desert is taken into consideration, all the cactus fruits are very juicy. A plate of the sliced fruit, thoroughly chilled on ice, would be tempting indeed on a hot summer day, and as beautiful as a bowl of flowers.

They would undoubtedly be delicious in fruit salads, sliced and served with cream like peaches, and on account of their rich and varied colors would be very attractive in preserves or conserves, sherbets and ices, tapioca and gelatine puddings.

Maybe you think I am over-enthusiastic about this fruit Opuntia, if we give it its correct name. I don't mean to convey the idea that it is more delicious than many of the better-known fruits, but I think it is just as good, quite as beautiful, and it will grow and produce food, drink, and forage abundantly on poor soil with practically no cultivation, and if left undisturbed will increase constantly in size. It represents more than 16 years of hard, painstaking work and study on Mr. Burbank's part.

If we of the human race learned our lessons under the Great Teacher as well as the desert cactus learned under its teacher, Mr. Burbank, lost the thorns of our characters, and so lived that our lives would produce abundant and valuable fruits amid discouraging environments, this world would be a happy place for all, wouldn't it?

FAST-GROWING walnut trees which are grown for their beauty, both as trees and in the form of lumber, may not belong on a food page, but they are going to have a little place on this one not only this month, but in the future, if they behave as they should and grow.

Last May I told about seeing the large walnut tree which had attained in nine years a wonderful growth. I said then four years, but corrected it in a later issue after Mr. Burbank corrected me. The name of that variety was the ''Paradox.'' I have wondered since if Mr. Burbank heard the tenth commandment crack as I stood looking at that beautiful tree, which looked as if it might be fifty years old instead of nine. Whether he did or not, he later promised me one of them together with a ''Royal,'' which is an equally beautiful and quick-growing walnut and hardy enough to stand our climate.

After Mr. Burbank's letter came I lay awake nights worrying for fear I could not find a man to help me plant them, for our boys are away at school, their father was just about to leave for some weeks on a business trip, and even unskilled garden help is almost impossible to obtain in our vicinity. To tell the truth, while I have never been tempted to exchange my husband for any other man, not even a garden lover, sometimes, as in this particular instance, I have wished the marriage service had read this way, ''I promise to love and cherish her and spade her flower beds.''

The trees finally came the day before Thanksgiving, one of our kind friends found another who knew all about setting out trees, and now the baby trees are safely planted, cuddled in warm straw blankets and protected by strong stakes. Maybe when the gentleman comes home and sees the location of the ''Royal'' it will be a lesson to him to stay at home and look after his wilful wife, for it is where she wanted it and not where he advised her to put it. It stands in the middle of a large, open space in the lawn where it will eventually shade the porch; that is, it will in a very few years if it grows according to schedule. If it does not then I shall have to tell that husband of mine that I am sorry I did not obey him and put the tree in a less conspicuous place. The less hardy tree, the Paradox, is planted where the man of the house suggested. The buds on that one looked green and swollen when it came. I hope the infant tree will not make a fatal mistake and attempt to grow before our winter is over.

If those walnut trees live and if I live—as a Gleanings correspondent—you will probably be informed of their condition at least once a year, altho it would be humiliating to have to admit their untimely death, or worse yet, failure to make the expected growth. Just possibly they will deserve being photographed for this page in the future.

Beekeeping as a Side Line

Grace Allen

BEFORE making my plea this first month of the new year for the advantages of beekeeping as a sideline, let me insist first on the importance of sidelines themselves.

When a man's chief work has been chosen under a flaming inner compulsion, as the one thing in the whole world he wants to do, then perhaps he scarcely requires a sideline, unless, indeed, for health's sake. Possibly a vocation worthy of the name, in its rich primitive sense of a calling, a bidding, an invitation, leaves no room in one's heart for an avocation that calls one away. Probably sidelines, avocations, are of modern growth, born of commercialism and a strangely unyielding economic system that no one understands well enough to improve. But true it is that today countless men speak of their work as a grind, a monotonous routine, a strain. And they plan instinctively and wisely to temper it with golf, to balance it with hunting and fishing, to forget its grim unloveliness in a garden. Often, even those who love their work also love to play.

So an increasing number of men are setting themselves deliberately to some interest or game completely apart from their daily work. Of all such, surely those of the great outdoors are most to be desired for business and professional men. To a man or woman who has been for many hours of many days shut in behind brick walls, golf or gardening or beekeeping will be of more benefit and probably bring keener delight than chess or wood carving or the collecting of etchings.

The sideline activity worthy to stand quite at the head of the list must call its follower out into God's sunshine, not force him into storms and disagreeable weather; it must exercise his muscles without straining them; it must be baffling enough to drive him to books and journals, tho not heavy enough to force him into long hours of difficult study; it must tempt him to a constantly increasing skill, without requiring too long practice or too wearisome toil; and it must cast its spell over his very soul, until there shall awaken within a new enthusiasm, a new wonder and a great love. And for most of mankind, if a sideline thus bring charm and challenge, pleasure and books and health, it will be pursued with a double zest if in the other hand it brings a profit that can be reckoned in dollars and cents.

Outside of a garden, then, where is there to be found a sideline so desirable as beekeeping? I say outside of a garden, because something in my heart makes me say it—God does so surely walk in gardens in the cool of the day—in all other places, too, and at all other times. But, oh, especially in gardens do we see and feel Him, and especially in the cool of the day. Do you remember how Alfred Noyes says it?

"In the cool of the evening, when the sky is an old story
Slowly dying, but remembered, ay, and loved with passion still,
Hush! . . . the fringes of His garment, in the fading golden glory,
Softly rustling as He cometh o'er the far green hill."

But where is there anything lovelier to add to a garden than a few hives of bees, painted white and set among the roses and hollyhocks and daffodils, or under young fruit trees or where the lilacs bloom?

Take first the mere matter of weather. A man goes faithfully forth to his regular work, no matter how hard the winds blow or the storms howl, no matter how biting the cold or how pelting the rain. But when he leaves his real work for a sideline interest, then he appreciates being able to avoid "winter and rough weather." See, then, how nicely beekeeping links itself with only pleasant days. Even during the spring and summer the bees are to be left alone in bad weather. And the last work done in the bee yard, or the "bee garden," as Gilbert White more gracefully says, in the blue-gold days of October while the bees are still flying to the fields bringing in their last fall nectar, is to see that each hive is heavy with a wealth of sealed stores, and that all its conditions are right as to numbers and room and general prosperity, to carry it without further attention on thru the winter and the long unpredictable spring. Some beekeepers then carry the hives into a cellar, some put them into large cases and pack them around with thick warm layers of leaves or chaff, while others let them stay where they are. Then they leave them alone, and the outside bee work is finished for that year. No going out into the biting, bitter days of winter. How shiveringly I remember the winter work when chickens were my sideline!—bundling up to carry out boiling water to thaw out drinking vessels frozen solid, getting chilled and cold. The only work a beekeeper does in winter is to sit by his fire, reading bee books and journals, to make his plans for the next season, and in his shop, or kitchen perhaps, to put new hives together. And eat his honey!

Those who have never kept bees may wonder that so simple an occupation should require any study. They know people who keep bees, and have kept them for years, and they are quite sure—and oh, they are right about it, too!—that these people are entirely innocent of reading or study or research. Beekeeping is not really a sideline with such people, it doesn't get them anywhere; it is just a sort of accident, a happen-so, really a regrettable delay on the road to progress. There the bees are. That's all. Often there are swarms; occasionally there is honey. When a swarm comes out the deluded keeper and his wife and his children and his servants come running with bells that they ring most gayly and pans that they beat most frantically, all unaware that the beekeeping fraternity is smiling at them for thus keeping alive a queer silly old tradition, "Better keep bees better or better not keep bees," as the popular slogan puts it.

The real sideline beekeeper who has studied and read has perhaps clipped off the wing of his queen bee so that she cannot fly, because he knows the swarm will never go away without her. Or, his wits sharpened by reading of the efforts and successes of others, he pits them against the bees' instincts, and keeps them from even wanting to swarm. He has studied the habits and behavior of the mysterious multitude that inhabit his correct modern hive, and he is learning all he can of their ways and their needs and what they will likely do when things are thus and so.

He has made the acquaintance of the nectar-bearing flora of his locality, and the time of its blooming. In February and early March the first swelling high in the elms and maples is to him as a message, and he looks to see his busy workers come drifting in with great loads of pollen. The dandelion means huge balls of precious yellow dust, rich in food elements for the baby bees being reared in the awakened hives. Blossomed apple trees and plums thrill him with the vibrating hum of his bees as they plunder and bless. He knows what disaster may come, and how to ward it off, when the unsubdued winter turns fiercely back to drive the spring into some hiding place that only the south wind knows. With new and more seeing eyes he watches the clover fields come into bloom. Basswood and poplar he counts as friends, and he thanks the hills for the sourwood tree. What were once to him but unnoticed weeds become heartsease and Spanish needle, and in the autumn he calls the wild aster by name.

He opens his hives, and what he sees that is not good he sets about to remedy. He recognizes disease and knows what men of science say to do. Where there is no queen he can give one so skillfully that even an inhospitable people accept her as their own and will die to defend her. If he would have more colonies, he knows how to set about starting new ones. He is aware of the ebb and flow of the nectar and adjusts his storage space accordingly. He takes a maximum of honey from his hives, and leaves a maximum therein for his bees. He meets the challenge of the hive with a wisdom and skill born of the experience of others whom he knows only thru the printed page.

As for the charm of it, think of coming from the office or bank, the factory or store or courtroom, from the noise and crowd and perplexities and the soul-wearying strain of it all, to some quiet spot where white hives are ranged along green grass under cherry trees or grapevines, where a mocking bird pours out its miracle of song across the sunlight and all around is the humming of bees. There is nothing like it in the whole world for the healing of one's soul.

If, after the first resting and enjoyment, he starts work—what work it is! He blows a bit of smoke into the entrance of a hive, removes the cover gently and draws out a comb of bees. And behold he is face to face with the very heart of the hive and its hidden workings. The comb may be newly built, white and waxy and fragile, or it may be old and dark and strong, reinforced with uncounted layers of almost invisible cocoons. It may be filled thru all its rows of six-sided cells with fragrant ripening nectar, or the rich, fully ripened honey may be sealed from sight under its silver covers; it may have eggs like tiny ivory specks in the polished cells, or wee white larvae waiting to be fed by the faithful nurses; or the cells and their occupants may be covered over, as with coarse fibrous blankets, hiding the age-old marvel of metamorphosis. There wings are forming that shall fly with eager strength across the light of summer days to come. There in the darkness each pupa is growing its three single eyes and two strange compound ones, that shall some day guide it with swiftness thru the ways of light and with patience thru the dusky hive. He may see one of these coverings being cut out by the strong mandibles of the now fully-formed bee within. And there in the singing silence he may watch the little life make its way out of the close darkness of its embryonic solitude into the crowded teeming tireless life of the hive. He may see the big-bodied drones loafing on the combs or hear their buzzing as they fly.

On some one of the eight or ten combs that hang so straight and parallel down into the sweet-smelling hive, he may find the queen, wearing her gold-trimmed raiment with a royal air. Her faithful attendants in a circle around her, she walks quietly across the comb, examining one cell after another to see if it be ready for the precious egg that she alone, of all the thousands there, can lay. And while she deposits it, with her long graceful body curved down into the cell, her attendants stroke her gently with delicate antennae.

So all the mystery and marvel of this little people living there among his roses unfolds before him, till he forgets the press and turmoil of the marketplace, taut nerves relax and his soul grows glad and strong, eager and serene, while the hours go singing by.

FROM NORTH, EAST, WEST AND SOUTH

In Northern California.—The year 1920 from a crop standpoint has been more or less disastrous. Alfalfa, our mainstay, was really our salvation; but even here the alfalfa output was scarcely more than half the normal. Jackass clover did well for a while; but almost all other fall bloom yielded practically nothing. Our fine Shasta honey (star thistle), one might almost say, hardly got into the market. On the other hand, there was nearly an average crop of orange honey and there is a tendency for more and more beekeepers to migrate into the southern valley for this excellent and almost sure source of nectar. Honeydew honey was conspicuous by its absence, and our usual large output of inferior grades was this year reduced by about two-thirds. The disease situation and the condition of the honey market during the fall months have been quite as disastrous as our crop shortage. There remains, however, one redeeming feature, the fact that we have had a live marketing organization. Everyone of us feels that, were it not for the California Honey Producers' Co-operative Exchange, our honey would be selling around eight and ten cents a pound instead of at the very satisfactory price which we have been getting and still are getting thru the Exchange acting as our agent.

Let us look into the coming year regarding our future prospects. In past years we worried much over our marketing problems; but nowadays these problems are the least of our troubles. Weather conditions that control nectar secretion we need not worry over, for it would do us no good should we worry. But what we do need and can get and have had in the past is more education for the beekeepers. Why is it that trained beekeepers always get twice as much honey per colony as the untrained beekeepers? Bee journals and other printed matter help, but there is nothing more efficacious to the welfare of honey producers than to have them gather at convenient places and listen to the teachings of trained men along the lines of their profession. In the past we have had some most excellent short courses in beekeeping conducted by the U. S. Department of Agriculture in conjunction with our State University. These short courses have been sadly missed this winter, and, notwithstanding the fact that we have had a short crop and ever-falling prices, one of the most general questions asked today is: "Aren't the Government men coming out this winter?" California is a big honey producer, producing twice as much as any other State, and there are not a few of us that hope that these highly beneficial short courses so helpful in the past can be held during the fall and winter of 1921. M. C. Richter.

Modesto, Calif.

In Southern California.—Honey prices are not satisfactory to the beekeeper who is holding his 1920 crop. There was a short time early in the season when the buyers were offering 20c for white orange and sage honey. But very few sales were made at that time. As the season advanced, lower prices were offered. Now no wholesaler seems anxious to buy unless at a price so low that the average beekeeper does not care to consider it. The State Exchange has sold all of its orange honey and a good part of its sage at prices that will give the beekeeper a living wage and a little to go on.

Several apiaries containing from 100 to 700 colonies of bees have been sold at an average of $10 a colony.

After a close examination, many more colonies are found that will need feeding than was expected a month or two ago. Many colonies that would perhaps struggle thru the winter will do much better if given a few pounds of feed.

The weather conditions are not as good as some time ago. In the early fall southern California had some rain, but of late (as the saying goes) "we have missed several awfully good chances." Vegetation, nevertheless, looks well and some good winter rains will enliven next year's prospects very much.

In the eastern part of Riverside County, next to the Arizona line, I recently passed thru the Palo Verde Valley, a part of the Colorado River Valley lands. This valley has some of the most fertile land in the world. Diversified farming was the rule until cotton prices went sky-high. Then practically the whole valley was put into cotton until this year about 26,000 acres were planted to this staple. Unfortunately the price of cotton has dropped to such a figure that many cannot afford to harvest the crops, and it is said that many acres will never be picked. While the beekeepers made a fair crop in this district, mostly from the mesquite, there is no doubt that where the farmers return to alfalfa and other crops, the honey yield will increase.

On my way from the Palo Verde Valley to Prescott, Ariz., I saw only one or two small apiaries. At Prescott I found dark granulated honey—said to have been made locally—in the stores, to be sold at 50c per pint jar.

From Prescott to Jerome there has just been completed one of the grandest mountain roads the writer ever rode over. Some of it cost $67,000 a mile. From Jerome I passed thru the Verde Valley, where the beekeepers are moving their bees to get away from the smelters of the mining districts.

Beekeeping conditions around Phoenix, Tempe, and Mesa, Ariz., have been good

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this year. About one case per colony on an average was produced. Mesquite, catclaw, and cotton furnished most of the honey. The cotton seemed to yield especially well in those regions.

An apiary of about 200 colonies near Tempe had become badly infected with American foul brood. It was condemned by the beekeepers and with the consent of the owner was entirely destroyed. Each of the apiarists interested gave his proportion of the colonies destroyed, and thus the entire apiary was replaced with healthy colonies. This is certainly a very charitable and commendable way to get rid of a diseased apiary.

Much of this year's crop of Arizona honey is still in the hands of the producers. Many of the beekeepers feel that an organization of some kind would be of much benefit. This would at least get the honey to central points and have it graded according to standard grades. The honey could be more readily shown to the buyers, and the prices would naturally be more nearly standardized.

Some cotton honey that I sampled was very white and had granulated until it was very solid. The beekeepers say that it will often granulate in two or three days. It had a flavor distinctly of its own.

My letter is being written up near the great Roosevelt Dam, that stores the water during the winter months and holds it in reserve for the long summer months when no rain falls on these desert plains. It is estimated that this reservoir will hold enough water for a three years' supply for the 205,000 acres covered by this project.

Corona, Calif. L. L. Andrews.

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In North Carolina.- With apiaries generally settled for the winter, interest among beekeepers centers about the approaching session of the North Carolina Beekeepers' Association to convene in Washington on Jan. 11. It will be a one-day session; but it will be chockfull of interest according to President James M. Gibbs and Secretary-Treasurer J. E. Eckert, who for some time have been engaged with the general arrangement of the program. C. P. Dadant and J. J. Wilder are to be especially interesting guests from without the State who will take a prominent part in the program. Mr. Dadant is to talk of "The Large Hive," and touch upon "The Building-up of Commercial Beekeeping." Mr. Wilder will talk of "Beekeeping in Dixie." Government Bee Specialist C. L. Sams, who is doing so much for the quickening of interest in better beekeeping in this State, will have a large share in the program; and the other participants will include C. D. Duvall of Williamston, O. C. Weill of Coolemee, J. A. Ratcliff of Washington, and Prof. E. P. Metcalf of the A. and E. College, who has the direction of a special course in bee culture.

Thruout this State farmer beekeepers are becoming more and more interested in better beekeeping and in the advantages of standard equipment. R. J. Bryant of Ronda, talking for one of the state daily newspapers, said this week that this was an especially good season for beekeeping in his section, and that after 10 years of careful work among his half hundred or more hives he is convinced that his work with his bees is proving much more profitable than raising tobacco. He produced a splendid crop of sourwood honey this season.

Wilmington, N. C. W. J. Martin.

* * *

In Ontario.—Bees here in this part of Ontario have gone into winter quarters in rather poor condition so far as a late flight is concerned. Following a month of almost summer temperature all thru October, November was cooler than usual and not a day warm enough for a general flight. Here at home we waited in vain for an opportunity for a cleansing flight for our 60 colonies before going into the cellar. But no day warm enough came along, and on Dec. 6 they were carried in. The same cellar is being used that we had last year—the one built entirely underground and covered on top with cement roof and earth over all. We had hoped with thorough drying out for a year that a higher temperature would be recorded; but evidently we have hoped in vain, as the thermometer again stands at from 42 to 43, not varying a degree, no matter what it is like outside. This cellar is perfectly dry to all appearances; but, of course, that is too cool a temperature for best results, according to the best auauthorities.

While at the convention held in Guelph last week, evidence was forthcoming a plenty, that much honey is still in the hands of producers. Wholesale prices, nominally at least, have taken a heavy slump during the last 10 days, and the market is unsettled, to say the least. Importations of New Zealand honey and low sugar prices are given as the reason; but, above all, as I see it, is the general feeling of waiting to see what will happen. As a result, sales are either much restricted in volume or not put thru at all. But, as pointed out in the last issue of Gleanings, this state of affairs is only to be expected in the general line of readjustment that is taking place along all lines.

The convention already referred to was very well attended, altho I do not think that as many were present as is usually the case. Every courtesy was shown by the college authorities to make the visitors com-

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fortable, Secretary Millen being especially busy. We were fortunate in having Dr. Phillips with us as well as Mr. Demuth, his late associate at Washington, D. C. Both these gentlemen gave very instructive addresses on bee-behavior, wintering of bees, etc. Mr. Kelty of Michigan also gave a splendid address along the lines of diagnosing the two foul brood diseases, and if any one who heard this address does not now have a knowledge of the symptoms of the brood diseases, it isn't Mr. Kelty's fault.

One of the outstanding points of interest at the convention was the Markle extractor placed on exhibition by the Hamm brothers of Brantford, Ont. Some improvements are noticeable, as compared with the machine shown in Toronto two years ago, and without exception, so far as I could find out by inquiry, every person that saw the machine was of the opinion that it would entirely revolutionize the honey-extractor of the future. The eight baskets of the machine are all very rigidly constructed and yet are not clumsy. With one hand they can be lifted out of the sockets for cleaning or other purposes. Nothing is in evidence at the top of the machine except the baskets, so every facility is present for rapid work. But the great feature of the machine is the wonderful reversing action which is controlled by a foot lever. By simply touching the control lever the combs can be reversed just as often as one wishes; and, what is more wonderful, these changes can be made while the extractor is at full speed, and with no injury to the combs. While the machine is spinning rapidly, the reversing action takes place so smoothly and quietly that no jar is noticed to the machine, and one's eyes have to follow the baskets very closely to notice the changing of position.

The beauty of the mechanism as to reversing so easily and rapidly comes in very nicely when handling heavy combs of thick honey or newly drawn combs. One side can be partially extracted, the comb reversed, and the process repeated as often as one wishes till the combs are clear of honey. All who have extracted much honey know just what that means. Another feature applies to the matter of setting the comb baskets at any angle desired. Experiments prove that combs placed at a certain angle offer less resistance to the air when the machine is in motion, and consequently cells are emptied more easily and more quickly than with the old-style baskets. As stated, the baskets are readily adjusted by set screws at the bottom, if I remember correctly. The foregoing observations are given from memory and by one who has little if any mechanical ingenuity; so, if some slight errors have been made in this short write-up, the manufacturers, or any others for that matter, will please consider where it came from. However, I regard this machine as a wonderful invention, and I sincerely hope that the man responsible for the improvements may reap a rich reward for his work. J. L. Byer.

Markham, Ont.

* * *

In Iowa. — The unexpected has again happened. The bees were not snugly put away in the cellar until today, Dec. 15. They were flying Dec. 13, after a heavy thunder shower, which that night turned into a light flurry of snow, this mostly melting off the next day. This is the latest we have ever left our bees out. Our records show Dec. 6 as the next latest, and more often about Nov. 20.

In my last letter to Gleanings I said the demand for honey was very moderate. Since that was written conditions have grown worse, and I now say the demand is very extremely and decidedly moderate. In fact, it has moderated until it is so quiet that you can scarcely hear anything that sounds like honey. I have never seen such a condition since I have been in the bee business. I have about 350 mail-order customers, and under ordinary circumstances these would have taken all I produced. By Jan. 1, 1920, I had disposed of about 23,000 pounds of honey and could have sold more. I have sent out my second batch of price lists, with the price somewhat reduced from the first (something I have never done before), but can see nothing gained as yet from doing so. I doubt very much if the slashing of prices would do any good under present conditions. It just seems that people are not buying honey. The fact of the matter is that everybody is buying just as little as possible, and that little is what they must have. Honey is not the only thing that is a drag, and beekeepers should not get discouraged or excited and slash prices clear below reason. It would only make matters worse, and the beekeeping fraternity would all suffer alike. The present conditions cannot always last. We may have to lower our prices in some instances, but don't let us lose our heads and slash the price away below cost of production. If you do, remember the big buyers will gobble it mighty quick, and you have gone a long way to destroy fair honey prices.

I read Mr. Chas. Blaker's contribution to this department last month with much interest, especially what he had to say in condemnation of the inspector's work being solely educational, and doing away with the inspection of bees and the law. Amen. I hope Minnesota will never be so foolish as to nullify the law giving the inspector authority to inspect bees and to see that the fellow who has foul brood cleans it up. W. S. Pangburn.

Center Junction, Iowa.

HEADS OF GRAIN FROM DIFFERENT FIELDS

Rendering Diseased. Combs. I most heartily endorse what editor has to say in December Gleanings (page 714) regarding the shipping of diseased combs —at least I endorse up it to the point where he advises heating them in water, and then shipping the residue. I am not at all sure that they would be sterilized by such treatment, unless they were boiled for a long time. Another fatal objection to such a plan is the fact that such residue will be destroyed by mold in a very few days, especially in warm weather. I have tried the method more than once and have always found that the last state of those combs was worse than the first.

After rejecting the Editor's suggestion, I do not find it so easy to give a better one. I have rendered many diseased combs myself, and think that I can do it safely; but it requires such very careful handling that it is doubtful if it ever pays, unless one has a place especially prepared for the work. My advice to all who have diseased combs is to dig a hole in the ground, make a good fire in the bottom of it, and burn the combs, frames, honey, and all, and then fill the hole with earth. As an inspector who has watched the attempts of the average beeman to treat diseased colonies and save the wax, I do not wonder that diseases of bees are widespread. It seems rather a marvel that any healthy colonies are to be found.

Newman, Ills. C. F. Bender.

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Beekeeping in Northwest Washington. Bees in northwestern Washington are wintered outdoors in single-walled hives. Sometimes a cheap shed is erected over them. The problem here in wintering is not protection from the cold so much as it is protection against dampness. The spring bees came thru the winter in good condition, with but few losses.

Bees can often take frequent flights thru the winter months. In February they start to gather pollen. In the latter part of April, according to weather conditions, the fruit bloom and the dandelion bloom start, which often offer a surplus of honey, if the colonies are strong and weather conditions are favorable. Sometimes a wet spring will hinder the bees from working, and as a result often affect the fruit crop. The white-clover flow starts in June and extends well out into July. After the white-clover flow, nectar is gathered from the fireweed, which in many localities grows and blossoms abundantly, and which is a source of much delicious honey. These are the three major flows, altho there are many flowering plants that bloom along thru the spring and summer.

Ferndale, Wash. Carl J. Menze.

The Honey Babe. I will try to give a few facts of feeding honey to my babe. At nine weeks she was very ill, and we could see that the two physicians who were doctoring her were giving her no relief. We felt that she was fast slipping from us. In desperation we began experimenting with her food ourselves. We started her on Eskay's food and added ½ to 1 teaspoon of honey to each bottle, and between each feeding when she would cry from hunger we used a comforter dipped in honey. We kept her bottles regular that way, increasing the honey according to the increase in food. She gained from the first feeding. After her first honey bottle as we called it, she went to sleep and slept eight hours tho she had not been sleeping more than ten minutes at a time for a few weeks. May I add it was the longest eight hours in my life I ever put in. We felt that perhaps we had killed her; but when she woke up she was fine, and has never been ill since. Today she has all the honey she can eat and has it practically every meal. At 20 months she has 20 teeth and is strong in every way. I find honey superior to sugar for a child's food, since sugar tends to ferment the food in the child's stomach while honey does not have that tendency.

This baby, honey fed, was won back to health.

Mrs. F. R. Tompkins.
Niagara Falls, N. Y.

* * *

Egg-Eating Bees. Having had considerable time on my hands this past season, I have been able to study the habits of my bees more closely than ever before. I have an observation hive in which I put a virgin queen with a handful of bees. I was naturally interested to see when the queen began laying, and I spent a lot of time watching for her. Finally I saw her come out of the crowd and lay in the lower cells, but next day these cells were empty. In a

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day or so she laid in them again, but no brood came in those cells. So I concluded the bees knew they could not keep these eggs warm, and so did away with them. I have lately read the statement by Dr. Phillips that the bees eat the eggs of drone-layers.

I once had a queen that used to put two to seven eggs in a cell, and yet everything went along quite normally in the hive. There were other hives that did better and had more brood, so it looked to me as if they destroyed those extra eggs, instead of distributing them around in empty cells as good bees are supposed to do.

From these observations it seems that it is quite likely that many a queen gets blamed, when the workers are really to blame for not making an effort to raise brood from all the queen's eggs. Of course, if the queen is the mother of these bad bees, she may be partially responsible for their characteristics. But I think it is more likely that conditions at the time, such as the age of the nurse bees, amount of stores, pollen, and all the general conditions that make a good working force—these will decide whether the eggs will be destroyed or not. Will H. Gray.

Northlonsdale, B. C.

* * *

Prominent Australian Apiarists. F. R. Beuhne has spent some 28 years of his life among the bees, and his apiary is a model of what an apiary should be. Situated in an orchard, it has an extremely picturesque appearance and is as neat and orderly in arrangement as it can well be. The honey-house is most compactly arranged, as there is a place for everything and everything is in its place.

A picturesque apiary belonging to F. R. Beuhne at Tooborac, Victoria, Australia.

Mr. Beuhne was for many years president of the Victorian Apiarists' Association and has been one of the main forces in holding the association together. Besides being a good beekeeper he is also a first-class botanist. His writings on the honey-producing flora of Australia are most valuable and should be in the hands of every beekeeper in Australia, California, and other parts of the world where the eucalyptus is largely grown. What comes from Mr. Beuhne's pen can be relied upon as coming from one who has had a wide experience.

Mr. Cutler's apiary and honey-house.

Another successful apiarist is Herbert Cutler, who gave up business in Melbourne to take up beekeeping. His is another model apiary.

Have you ever noticed that beekeepers with a business training are invariably successful? They have been trained to those systematic methods of working so essential in the management of a large number of colonies, and they appreciate the advantages of attention to detail in marketing their produce in an attractive and uniform style. Mr. Cutler's honey and wax always bring top market price because the goods and packing can be relied upon.

Besides the home apiary Mr. Cutler has several out-apiaries. He uses the modified Heddon hive principally, tho he also has some Langstroth hives. B. Blackbourn.

Melbourne, Australia.

* * *

Wax Production. Last year in the June Journal of the Franklin Institute there was an interesting article by Enoch Karrar, Ph.D., Research Department of the Philadelphia United Gas Improvement Company, on the efficiency of light production in organisms. One part of it throws some light on the production of wax. He says that it has been found that 12 g. of cane sugar will produce 1 g. of wax. At another time, 24 g. of sugar produced 1 g. of wax; but now comes the important point: The energy content of sugar is 1860 calories (Farmers' Bulletin No. 142 gives it as 1750: calories of honey, 1420; maple sugar, 1250; molasses, 1225), whereas beeswax is 9043

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calories, or about five times as much as sugar.

Sugar is composed of carbon, hydrogen, and oxygen—$C_{12}H_{22}O_{11}$, and wax has less carbon and much less oxygen. This surplus of carbon and oxygen must be removed from the sugar, requiring the bees' energy (which is derived from the sugar). From the amount of calories in each it is apparent that, if there were no waste energy, it would require about five pounds of sugar, or 6⅓ pounds of honey, to make one pound of wax, so that, if the bees were 50 per cent efficient, it would require ten pounds of sugar, or 12⅔ pounds of honey, to make one pound of wax.

Looking at it in another way, it would be impossible for bees to make a pound of wax with less than 6⅓ pounds of honey. Then it would follow that if honey were worth 20 cents a pound, wax could not be produced by bees for less than $1.30 a pound.

These figures may save some one from financial failure who intends to try raising wax as a business, as it would require very cheap honey to make wax at its present price—probably less than five cents, if not as low as three.

The article also mentioned that in one case it required much less sugar when pollen was used. By adding 8 per cent of pollen, over 30 per cent wax was produced.

Hammonton, N. J. C. E. Fowler.

* * *

Wintering in Clamps With No Loss. Last winter my bees wintered well and came out 100 per cent alive and very strong. They were packed in single clamps with six inches of packing on all sides and four inches on the bottom. On the 20th of March I heard them humming very loud, so I cleared the entrances out. There was four feet of snow then in the bee-yard and the bees were flying well. Fearing I might lose my bees I drew two loads of manure from the barnyard and spread it on the snow. I did not lose a bee. As the snow went down the manure was always on the top, and when my neighbors told me they had just put their bees out from the cellar (the 15th of April), my bees were bringing in pollen, and the last of May I had to divide them. After that date we had six weeks of dry weather and then three weeks of very wet weather; but in spite of the two extremes they gathered 175 pounds per colony, and I made an increase of 80 per cent. The coldest weather in the winter of 1919 was 60 below zero, and the temperature remained at 50 below for two weeks. My bees had no windbreaks, only the clamps. I am wintering four colonies in one case this winter and the rest of the yard in single clamps. Other winters I have tried to winter my bees with no bottom packing and they all died. Young queens, strong colonies, good stores, and good dry packing are the only way to winter bees here. When we winter in a cellar they have to have spring and fall protection, but the winter clamp is always ready for the cold and the heat.

I use the standard hive with Dr. Miller's two-inch bottom-board. I make my increase on the Alexander plan, sell my crop at home, giving good value for cash received, and put my honey up in no less than five-pound pails. I have a daughter nine years old that helps me in our apiary. She says she is going in for section honey on her own hook in 1921. So she is buying a one-pound package with an untested queen for her start. She will start young and I hope start right. She is all taken with that young beekeeper on page 614 of October Gleanings.

New Ontario, Canada. A. Hulcoop.

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Need of Two-Day Schools in Beekeeping. An apiary inspector in Indiana, I have come to the conclusion that the people that keep bees and are not beekeepers, surely do need more education in beekeeping; and I think it would be a good thing if more States would try a two-day school for beekeepers, such as Michigan held last year in nearly every county of the State.

Indiana is doing fairly well, but we could do a whole lot better. We have been taking auto tours this last season, going around showing how to transfer, treat diseases, etc., and especially how to use the modern hive, which I think is one of the most important parts of the whole bee business for the amateur. I have found plenty of places where they have discarded good hives and were using old box hives just because they had used no foundation and did not have the hives put together right. They thought the hives were no good and cost more than boxes. I found one locality where there were plenty of good hives, but they had used no foundation nor the tin rabbets that go with the hive, and, of course, there was about ¾ of an inch of honey between the super and the frames. Removing the super from such a hive and looking for foul brood makes a pretty bad mess. When I asked them why they did not use the rabbets, they told me that the bee-supply dealer did not give any with the hives, and they did not know there was anything missing; so I went to the man that had sold all these good hives. He had 23 colonies of his own, but I found them all in the same condition. When asked why he did not use the rabbets, he told me that he never knew where they went. He had them

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lying all around in his shop. Some he had used to nail on his inner covers. Now this man has been keeping bees for 23 years and selling bee supplies for that long, and yet did not have a single hive that I could lift a frame out of. So I do not think he has given the modern hive a very good boost. I believe that every man that sells bee supplies should know how to put them up and should strongly urge the use of comb foundation. T. C. Johnson.

Logansport, Ind.

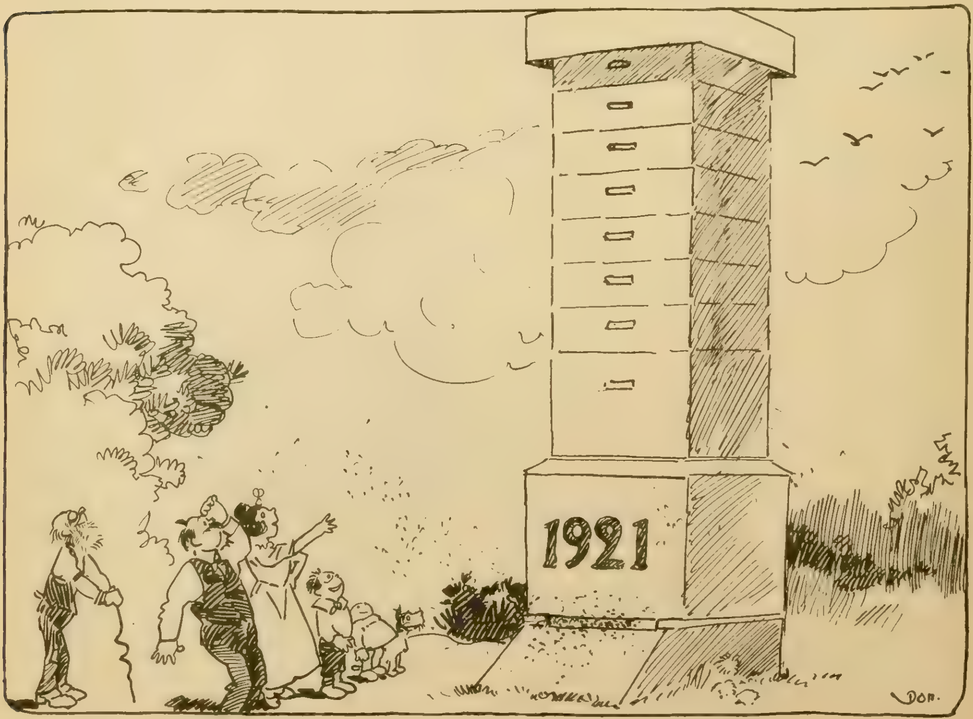
Must Have Stolen Them. Bees steal eggs? No doubt about that. One could not prove it in a court of law, as he would have to have witnesses who saw the bee steal the egg and get away with it. I have several times come across colonies (queenless, of course) with only one or two eggs, from which they raised or tried to raise queens as early as February. If they did not steal those eggs from some other colony, where did they come from?

Fredericktown, Mo. Jas. Bachler.

The New Year. By Bill Mellvir

(With Apologies to Walt Mason.)

I hail the bright and glad new year—I say to it "Good day" and shall not stop to shed a tear for that one passed away. The old year goes out with a wheeze all limp and rheumy-eyed, the new year comes in like a breeze all wool and three feet wide. The old year when its tour began was full of buoyant hope, but now we've put it in a can as disappointing dope. I hail this newborn stranger now. I hope he has the goods to give us all the laws allow and lead us from the woods. I hope the bees will winter well and be so strong next spring that every colony will swell with pep and go, by jing. I hope we'll have a honey flow that fills up shot-tower hives so we can have some coin to blow for fodder for our wives. But when we've earned the rubles fine I hope we'll save a few to salt away in luscious brine as all the wise ones do. But if the new year brings no wealth I hope he'll not forget to bring us all most joyful health for that's the best thing yet. Then we can warble and perspire thruout the summer's day as busy as a house afire till time to hit the hay. The old year's buried out of sight beneath the grime and grit. The new year starts his hopeful flight and ought to make a hit.



JUST NEWS

Editors

A WELL attended meeting of the executive committee and friends of the American Honey Producers' League was held at the Great Northern Hotel, Chicago, on Dec. 6 and 7, all members of the committee being present as well as a considerable number of prominent beekeepers from widely separated parts of the country. This meeting was largely for the purpose of discussing matters of large importance to the League in advance of the second annual meeting, which is to be held Feb. 15 to 17, at Indianapolis. Great interest was shown at this executive commitee meeting of the League. As a result, the annual meeting to be held at Indianapolis next month may be expected to be largely attended and its results important. Every beekeeper and every friend of beekeeping in the country, who can attend the Indianapolis convention either as delegate or friend, should be there.

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The Tennessee State Beekeepers' Association will hold its annual convention at Nashville on Jan. 27, 1921.

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The annual meeting of the Ontario County (N. Y.) Beekeepers' Society will take place on Jan. 11, 1921, at the courthouse in Canandaigua.

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Ohio State University will give another beekeepers' short course, Jan. 31 to Feb. 5. Dr. E. F. Phillips of Washington will be in direct charge. Editor Geo. S. Demuth of Gleanings is also to be on the program.

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The Division of Bee Culture, University of Minnesota, will hold a short course for Minnesota beekeepers Jan. 3 to 8, 1921. Francis Jager, chief of division, in making this announcement, says that an effort is being made to make this short course of unusual interest.

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O. E. Timm, secretary-treasurer of the Nebraska Honey Producers' Association, Bennington, Nebraska, announces the fourth annual meeting of the Nebraska association to be held on Jan. 4, at the University Farm at Lincoln. There is a very full program, and a special effort will be made at this meeting to get a new foul-brood law enacted in Nebraska.

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An important convention of Florida beekeepers, comprising several adjoining counties, was held Dec. 3 at Tampa. An organization was effected and a constitution adopted. A recommendation was put thru setting aside a week in the first part of the year to be observed as ''Florida Honey Week,'' and petitioning the Governor of Florida to declare the first full week in January as Florida honey week. On the following day at Bradentown there was a meeting of the Manatee County beekeepers at which W. A. Selser and E. R. Root were the speakers. The plan of a honey week throut the State was indorsed.

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The 32d annual meeting of the California State Beekeepers' Association will cover a four-day session Mar. 1, 2, 3, and 4, 1921, in Oakland. Cary W. Hartman, president of the Alameda County Beekeepers' Association, and chairman of the program committee for the annual meeting, writes that it is expected to make this the biggest and best meeting in the history of the organization.

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The beekeepers of Deschutes County, Ore., met at Redmond on Dec. 7 and organized a county association. The officers are: President, A. J. Sanford of Redmond; vice-president, B. D. Becker of Tumalo; secretary, County Agent Jamison of Redmond; treasurer, John Marsh of Tumalo. Oregon beekeeping interests are being well looked after at this time by her extension specialist in bee culture, H. A. Scullen, of Corvallis.

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Beekeepers of New Jersey are looking forward with much interest to the annual meeting of the New Jersey Beekeepers' Association to be held on Jan. 13 and 14, 1921, at Trenton. C. P. Dadant is on the program to discuss the Dadant hive and system of beekeeping. Geo. H. Rea, extension specialist in apiculture for New York State, and Mr. Myers, a large honey-producer of the same State, will also address the meeting.

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Thomas Newcastle, the father of beekeeping in the Hawaiian Islands, died at his home in Honolulu on Nov. 16. He was not only the first practical beekeeper of the Islands, but also the first extensive honey-producer to operate there. He had been a resident of Honolulu for 42 years and at one time had an apiary of 500 colonies within the city limits of the Hawaiian capital.

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N. B. West, inventor and manufacturer of the West queen cell protector and the spiral queen cage, died at his home at Middleburgh, N. Y., on Nov. 9 last, at the age of 76 years. He once told a friend that both the spiral queen-cell protector and the spiral queen cage were suggested to him by the spiral spring used in the hanging device of a bird cage.

GLEANED BY ASKING

Editors

QUESTION.—I have watched carefully this summer for traces of disease, but saw no trouble until cool fall weather came. This morning with a wire I pulled out a small saucer of dead bees, nearly all of which are young and some are undeveloped. If the bees continue to die, would you destroy them this fall and extract the honey? Earl A. Walldorff.

New York.

Answer.—The undeveloped bees which you found dead on the bottom-board do not indicate that the brood is diseased. It frequently happens in the fall that some of the last brood in the hive, even when nearly mature, is abandoned by the bees. It is not known why bees should ever do this, but it is probable that during cool nights, in forming a cluster, they leave some of the brood exposed which is then chilled and afterwards carried out.

Question.—I intend to buy package bees in the spring and hope to get some surplus honey from them. Will five pounds to the colony in ten-frame hives be enough for this? Theodore Robinson.

Ohio.

Answer.—The number of pounds of package bees which you will need in each hive depends upon what time they are received in reference to the honey flow. Five pounds of bees at the beginning of a short honey flow would not be enough for most profitable honey production, since the honey flow would probably close before young bees in sufficient numbers would be ready for field work. After you put the bees in the hive, it is three weeks before young bees begin to emerge and about two weeks more before these young bees begin to work in the fields. Therefore the field force would be constantly reduced by the old bees dying off for five weeks after the colonies are established.

If the package bees are received five or six weeks previous to the beginning of your main honey flow and each colony is supplied with an abundance of stores as well as empty combs, so that brood-rearing can be carried on extensively, there should be a great horde of young bees ready to gather the crop of honey; and, in this case, their numbers are increasing instead of decreasing. Three pounds of bees should build up to sufficient strength in time for the honey flow, if the packages arrive six weeks previous to the honey flow and even two-pound packages should give good results.

Question.—What do you think, for winter, of a hive with brood-combs running cross-wise with the entrance at the side of the combs instead of at the ends? And how would it be for summer? E. A. Tropp.

Montana.

Answer.—Years ago this arrangement of combs was thought to be important for winter. It was called the warm way, and many of the earlier types of movable-frame hives were arranged as you suggest. The plan has been abandoned by most beekeepers, however, and it is probably of no great importance, especially when the entrances are closed down to a small opening for winter. During the summer, it may be easier for the bees to ventilate the hive if the entrance is at the end of the combs, but the chief reason for having the entrance at the end of the hive is because it is desirable to have the bottom or floor of the hive slope toward the entrance so that water will run out. This would throw the combs out of plumb if the entrance is placed at the side.

Question.—The combs in my hives appear to be of considerable age. Would you advise that I replace these old combs with new foundation in the spring? N. E. Anderson.

Virginia.

Answer.—It is not necessary to destroy combs because of their age. You probably have in mind the fact that the cocoons are left within the cell when the young bees emerge, thus making the cells a trifle smaller. After many generations of bees have been reared in the same comb, the bees may tear away the walls of the cells and rebuild them. In doing this, the base which is now greatly strengthened by cocoons, is not torn away, thus making the overhauled comb stronger than a new one. Drone-comb, of course, should all be removed except the few small areas usually found in the lower corners of the frames.

Questions.—How would this plan work in running for comb honey? Use ⅜ x 14-inch entrance, place upon the bottom-board a queen-excluder, then an empty shallow super (without frames), then the regular brood-chamber, and add comb-honey supers as needed. (1) Would not the empty shallow super underneath the hive give clustering space to the extent of controlling swarming? (2) If a swarm did issue, the queen being detained by the excluder, would she not, after two or three attempts at trying to swarm, kill all cells and abandon the swarming idea? Ralph Gaston.

Pennsylvania.

Answers.—(1) One difficulty with this plan is that the empty space for clustering provided below the brood-chamber would not remain empty very long during the honey flow, but it would be filled with combs. Swarming might be delayed while this space is being filled, but later such colonies would probably swarm during seasons favorable for swarming. Another objection to giving this extra room is the delay in the beginning of work in the comb-honey supers because of the room for comb-building below. This delay in the beginning of work in the supers until considerable honey is stored in the brood-chamber would, in fact, increase the tendency to swarm. In order to use this principle in comb-honey production, it would be necessary to fill the shallow extracting super with slats, so spaced that no combs would be built between them but leaving room for a large number of bees between the slats. Dr. Miller used a deep bottom which provided a two-inch space under the brood-combs, and a rack was used in this space to prevent its being filled with combs. Such an arrangement should reduce the tendency to swarm, but cannot be depended upon to prevent swarming in comb-honey production. (2) The old queen would probably not have an opportunity to kill the young queens in their cells, but after two or three unsuccessful attempts to go out with the swarm she would be killed by the workers. Later, when the young queens begin to emerge, the colony would attempt to swarm again, and, unless a virgin queen should escape thru the excluder, the colony would attempt to swarm every day or so until but one virgin queen remains alive. In the meantime, with so many attempts to swarm, the colony would not accomplish much in the way of work in the supers.

Question.—At the close of the honey flow, I left with each of my two colonies a half-depth extracting super about three-quarters filled with honey. I have contracted the entrances and wrapped the hives with tar paper. The temperature seldom reaches the freezing point here in southern California. I wish you would criticize my methods and advise how to operate in springtime.

California. Dr. W. G. Chambers.

Answer.—Leaving a shallow extracting super full of honey, or even three-fourths full, for each colony in addition to the honey they may have in the brood-chamber at the close of the season and contracting the entrances for winter are both steps in the right direction for good wintering. Wrapping the hives in black paper, however, may not be good practice for southern California, since the black paper may absorb too much heat from the sun during the day and induce the bees to fly at times when it would be better if they would remain quiet in the hives. If some kind of packing material is placed between the hive and the black paper, the day and night temperature within the hive would not vary so much, which should result in greater quiescence and therefore better wintering. Unpacked hives which are painted white will have less daily variation of temperature than dark-colored hives, especially in your climate, on account of the dark-colored surface absorbing more heat from the sun than a light-colored surface. The important thing about spring management is to see that each colony has an abundance of stores in advance of immediate needs as well as plenty of room for brood-rearing during the six or eight weeks just preceding the beginning of the honey flow, in order that brood-rearing may proceed at its maximum rate during this period. If the bees cannot gather nectar from some minor sources, you should see that each colony has never less than 15 to 20 pounds of honey thruout this important brood-rearing period. In order to supply sufficient room for the greatest development of the colonies previous to the honey flow, you may find it necessary to add a second full-depth hive-body, since the single brood-chamber and the shallow extracting super may not afford sufficient room for both brood-rearing and a supply of honey, especially if the bees are able to gather nectar from minor sources.

Question.—I have one colony which covered only six frames this fall. They have about 15 pounds of stores but were packed with about eight inches on all but the front. Will they need to be fed early in the spring? Theodore Robinson.

Ohio.

Answer.—While 15 pounds of stores may be sufficient to last a well-protected colony until brood-rearing is begun, it is not at all safe to depend upon this amount for winter. Your bees will probably begin to rear brood in March, and from that time on they will consume their stores rapidly. By selecting a warm day in March, you may be able to feed warm sugar syrup by placing the feeder immediately above the cluster, then replacing the packing around the feeder. The ordinary friction-top pail with small holes punched in the cover may be used for this purpose. In the meantime, it will be advisable to give the bees a cake of hard candy, to be sure that they will not starve before you can feed them sugar syrup.

Question.—I have my bees in the cellar with, I believe, enough stores for winter. Would you advise me to look about the last of January to see how much honey is left for their use?

Iowa. Edward Melsh.

Answer.—Usually it is best not to disturb the bees while they are in the cellar; but, if there is danger that they will run out of stores, it is better to examine them and supply stores, if necessary, than to let them starve. With only a slight disturbance to the colony, you can lay a frame of honey or a cake of candy on top of the brood-combs to make sure that the bees will have enough food to last until spring. In this case the cover being removed, the top of the hive should be covered with a blanket or some old clothes to prevent the escape of too much heat from the hives.

Question.—I want to start bee culture and would like to get Cyprian bees. I have had experience with other breeds, and I think I could manage the Cyprians. If you would know where I could purchase them, write me the address.

Ohio. James A. Wolfe.

Answer.—We do not know at present where you can obtain any pure Cyprian bees. They were sold in this country to quite a considerable extent along in 1884, 1885, 1886, and 1887, but the bees were so horribly cross that almost everyone was obliged to give them up. They are good honey-gatherers, however, but they will sting on the least kind of provocation, and smoke is utterly useless in the handling of them, and because they gather no more honey than good Italians they have been generally abandoned. There is so little demand for them that no one has offered them for sale.

BEES, MEN AND THINGS

(You may find it here)

MOST of the bees in Ireland have died of the Isle of Wight disease during the last few years. Beekeeping is in a backward condition generally here, most beekeepers having only a few hives. Yet the country should be a grand one for honey production, for goose or furze, hawthorn, lime or basswood, sycamore, and white clover abound; while in autumn there are many thousands of square miles of magnificent heather laden with the most delicious of all honeys. The Italian bee is almost unknown and is generally supposed to be very vicious and still more so in its crosses with the native bee. I imported two queens from Penne last summer.”—E. O’Brien, Mount Eagle, Dublin, Ireland.

“Please educate the queen-breeders to raise but one kind of untested queens, and let’s make them of the select variety. Many queen-breeders have lost my trade by listing two kinds of untested queens—the good and the bad.”—Geo. W. Moore, Centro Costa County, Calif.

“I finished extracting today (Nov. 17) or rather quit for the present, for there is considerable in the supers yet. I began the year with 130 colonies; increased to 264, and took 20,000 pounds of honey that nets me 25c per pound. How is that for a beginner in what almost everybody calls a poor honey State?”—C. C. Cook, Lee County, Fla.

“The fall honey flow during August and September and up till Oct. 20 was the best we have had in many years. This flow was mainly from cotton, it being too dry for either broomweed or goldenrod. All beekeepers who have young queens, will have their bees go into winter quarters in better shape than in a long time. Nuclei that I made on Aug. 8 have built up to fine colonies, and gave me 25 pounds on an average and have more than enough to carry them thru. During the last of the flow some colonies filled a full depth super in a week, not 35 pounds of honey, but perfect wired combs, the kind that hold honey. Since Oct. 20 we have had much rain, which was really needed.”—W. T. Rabb, Travis County, Texas.

“The metal cover of the regular hive is 18 x 22 inches, and that of the Buckeye hive is 21 x 25 inches. This is quite an area, practically all of which ordinarily drains off upon the alighting board. This dripping from rain or melted snow and even heavy dew falling directly in front of the entrance is undesirable. In moist weather in summer this dripping continues for some time after the rain has stopped and this results in returning bees often getting caught (tumbling over in alighting and getting wings stuck to the wet entrance). Why not arrange the hive-stand to be a very little bit leaning right or left, so slightly, however, that it would not be noticeable but yet would cause the water on the metal cover to drain off in any direction except on the front ‘porch.’ ”—Geo. J. Griesenauer, Cook County, Ills.

“Bees have gone into winter quarters in fairly good shape, but not overburdened with honey. Our usual last flow from rabbit brush practically failed on account of a heavy rain storm, and a succession of cold nights.”—T. V. Damon, Lyon County, Nev.

“I think it would be a splendid thing if the readers of Gleanings could be given a chance to purchase some of Dr. Miller’s gladiolus bulbs some time between now and spring, even if only one bulb were allowed to a purchaser. What could be a more touching memento?”—Herbert Lyon, Westchester County, N. Y.

“My bees did finely this year. Took 800 pounds of comb honey off eight hives. One hive made about 132 sections. I am about four minutes’ walk from the heart of town. All of my 15 swarms are full-blooded Italians except two which were swarms given to me this fall. I expect to get Italian queens for them next summer.”—A. C. Smith, Columbiana County, O.

“Altho I usually extract by the last of June, this year it was July 15 when I first found buckwheat coming in bloom, and then I extracted all supers. I had the clearest honey I ever had, a very light amber or lemon color. It sold very fast. Some customers that I have visited again this fall like the dark better, saying it had more taste.”—Robert Elwill, Providence County, R. I.

“I am much interested in the series of articles on comb honey by Editor Demuth, as I have been producing comb honey almost exclusively for the past 37 years. The last two years I have extracted some but do not find as good a sale for extracted honey as I did 40 years ago. I had one swarm of bees this season that finished 300 sections of comb honey. This was the most I ever took from one hive in a single season and I sold it for 37½ cents per section at wholesale, making $112.50 for the one hive. This looked good to me. I had another colony that swarmed on May 29 and I took 177 one-pound sections from it and 176 from the old hive, making 353 sections from the two at 37½ cents per section.”—Geo. W. Baker, Wayne County, Ind.

OUR HOMES

A. I. ROOT

Thy kingdom come. Thy will be done in earth as it is in heaven.—Matt. 6:10.

Love your enemies, bless them that curse you, do good to them that hate you, and pray for them which despitefully use you and persecute you.—Matt. 5:44.

They shall beat their swords into ploughshares, and their spears into pruninghooks: nation shall not lift up sword against nation, neither shall they learn war any more.—Isa. 2:4.

IN the Cleveland Plain Dealer for Aug. 27, 1920, we find the following:

> TWELVE MILLION ORPHANS.
>
> Compilations of the Red Cross show that twelve million children were orphaned by the World War. A stretch of human imagination is required to understand the magnitude of these figures. A picture of approximately fifteen cities the size of Cleveland, inhabited only by orphans, furnishes some idea of the multitude of parentless children who are starting out, saddened and handicapped, to struggle thru a generation.
>
> The orphan always is pitied by the whole neighborhood in which it dwells. Relatives, friends or charitable institutions usually try to comfort the unfortunate and to give it a chance while it battles thru childhood into manhood or womanhood. But even in America, where the care of orphans is exceptionally efficient, they have been deprived of something which cannot be made up by all the kindness offered. How much worse must be the plight of a great many of the parentless little ones in the war-torn nations where even strong men and women have trouble obtaining enough food and clothing to keep them alive!
>
> What will become of the war orphans? In the coming years many thousands of them will emigrate to the United States to earn livelihoods and to establish permanent homes. Try as one may, no logical way can be found to remove from the shoulders of this nation a great amount of responsibility for the future of these orphans. America has a vital interest in the kind of men and women they grow to be.
>
> The reactionaries in and out of the United States senate who are unalterably against our affiliation with the League of Nations would have us maintain a policy of "isolation" which clearly would further handicap the European orphans. League opponents would have America disclaim any responsibility for the prevention of another war which would produce another sad army of 12,000,000 or more orphans. But what do the millions of just and liberty-loving people in this country have to say?

I confess that I have been thinking of this matter before, of the orphans made fatherless, and sometimes motherless as well, as the result of the recent awful world-wide war; but the heading, *"Twelve Million Orphans,"* startled me. But the Red Cross is probably sufficient authority for saying that the statement can not very well be an exaggeration or that a mistake has been made. My impression is, offhand, that this world-wide war resulted indirectly if not directly in the loss of three or four million lives. This being true, it would not be at all strange if there should be the number of orphans mentioned to be cared for, or perhaps uncared for to a considerable extent by the whole wide world.

Who is responsible for all this? We are *all* responsible more or less. I came pretty near saying that every man, woman, and child in the whole wide world is responsible to a certain extent for this savage and heathen fashion of settling differences by cutting each other to pieces; and even now while I write a large part of human industry is devoted to the matter of shorter and quicker ways of cutting to pieces or blowing to pieces humanity—men who, we are told, were created in God's own image. We have been sending missionaries to foreign lands to teach the heathen modern civilization and to spread the gospel; but, oh dear me! what a sad need there is of spreading this same gospel here in our own land! Some of you may ask me how this wholesale murder, sad and deplorable as it is, can be avoided. Well, now, friends, I am but a poor individual to undertake such a momentous task as to answer the question; but please listen while I try my hand at it.

In our great cities they have a police force to restrain crime and criminals. If one policeman can not manage a case he has means at his command by which he can call for help. If the entire city in a crisis is unable to handle the mob, rebels, or anarchists, or whatever you may call them, it can quickly summon help. Thanks to God that, with our wonderful methods of communication at the present day, the State militia can quickly be called out. If the State is not equal to the task, federal troops may be called; and I have never yet heard of a case where federal troops were unequal to the task—at least since the time of our own civil war. Well, what we all need to do to manage war between nations is an arrangement quite similar to that between the cities and nations of the world; but instead of calling out federal troops we shall have something still higher—a concert of the powers and nations of the world. Well, I hardly need tell you that this very thing is under way, and our own beloved President of the United States has the credit of being one of the great principals in this movement; and yet we in our own country can not stand by him. In fact, our own citizens have been blocking the wheels to such an extent that while these nations—at least quite a number of them—are pushing ahead in this proposed league, our own country, at least while I write, Aug. 28, 1920, is hanging back when this nation really should be taking the lead in this crusade and greatest movement the world ever saw. May God help us in this crisis.

As I dictate, our nation is rejoicing in the victory for woman suffrage. I saw by the papers that there is a certain "gang" that claim they have some *women* as well as men among said gang, who are fighting just now "tooth and nail" to prevent the culmination of woman suffrage. I do not know whether anybody else has said it, but I said right out, it is the opponents of prohibition and of the League of Nations that are fighting so desperately to defeat universal suffrage; for everybody knows that the *mothers* of our land above all else and all others would be heart and hand in favor of prohibition and of the League of Nations both. People generally have suffered as the result of the world-wide war. Everybody and everything have suffered; but who can tell or who can measure the amount of suffering inflicted on the mothers of the whole wide world?

Let me digress a little once more.

During our own civil war in 1861 a poor ignorant colored woman stood leaning over the gate to watch the soldiers as they passed by on the highway. I do not know how long she stood there; but she evidently began to think there would be *no end* of the line of soldier boys; finally in desperation she said to the moving crowd, almost within arm's reach, "I don't su'pose 'you uns,' *all* have names."

It seemed to the poor colored woman that there could not possibly be names enough in the whole wide world so that each one of the moving throng could have a name of his own. A few days ago I went with my son Huber to the great busy city of Cleveland. While I was waiting for him to finish up some business on one of the busiest streets I started to read a daily. It happened to be about the time when the factories were closing down for the day, and crowds of men, women, and children were rushing here and there to catch their respective cars on their way home. Most of them had dinner pails, while others had bundles of recent purchases, but all were in a hurry. It made me think of the bees at the time of swarming. The stream of humanity was more interesting to me just then than any daily paper or any sort of print in the whole wide world. I studied the faces of both young and old. I tried to imagine what sort of people they were. I wondered how many of that great crowd loved the Lord Jesus Christ; and then I thought of the poor colored woman and her remark, "I don't s'pose you uns *all* have names." Well, my view took in only a small part of one street in that great city. If one could get a view all at once, say from an airplane, of every street in the city of Cleveland, what a sight it would be! And yet that whole city does not contain at the present time even *one* million people; and we are told in that clipping from the Plain Dealer that it would take 15 cities of the size of Cleveland to hold the orphan children who were made orphans by the world-wide war. A few days ago I asked my oldest son, Ernest, if there really was a prospect of *another* world-wide war. His reply was something as follows:

"Father, I am afraid there is danger of another great war sometime; and it looks to me now that the only remedy is the present League of Nations. Forty-three countries have joined it, and we are the only great power outside of it. What I am afraid of is that it will not function properly without Uncle Sam's help and co-operation. I doubt very much whether the other nations will accept a substitute of our making. The pity is that this got into politics."

Now, dear friends, I hope each and every one of you will read the clipping at the head of this talk, not only once but several times over until you take it all in. Shall the whole wide world let this work of *making orphans,* by the *millions,* go on? Shall our own great United States, the nation that we have often claimed heads the world in all great and good reforms, stand back and refuse to act, simply because it may cost us some money to take part and perhaps cost us our own lives in the effort to have a world-wide crusade started for "peace on earth, good will toward men"?

THE NEW SWEET CLOVER GROWN BY THE ACRE.

On Aug. 8 our photographer and myself visited the Ohio Experiment Station at Wooster and took the two pictures adjoining this. Our station received a little package of this clover seed at the same time I did,

No. 1—The new annual sweet clover as grown at the Ohio Experiment Station, Wooster.

and, as you will notice, "made the most of it." The seed was drilled (about the middle of May) in rows I think about 30 inches apart; but I presume they are satisfied by this time that this is altogether too close; and, as almost every seed germinated, the plants are too near together. I think they will average not more than an inch apart. This may be all right for feed, but it is certainly too close for blossoms or seed.

Picture No. 1 shows the field from a distant hill. No. 2 shows a near-by view, with your humble servant shading his face with his cap. Professor Welton, who was with us when the pictures were taken, in answer to my inquiry in regard to the value of sweet clover, said something like this: "Theoretically and from analysis it stands ahead of all other clovers, and perhaps all other plants; and, altho we have made some experiments in regard to its value for *feeding stock*, I can not just now give the result."

No. 2.—A glimpse of the same field taken near by, showing the height of the plants on one of the best places in the field.

NINE FEET TALL AND BRANCH 5½ FEET.

Planted seed from new sweet clover in my garden some time in May, 1920. I planted some seed from Ames, Iowa, at the same time. The Iowa seed has done somewhat better, but it may be due to locations tho in same row. I measured my best plant today, and it is fully nine feet tall. One branch that I measured was 5½ feet. The plants are covered with buds, blossoms and seeds, and on pleasant days with bees. Some seed is turning brown now, and I hope a lot may mature. LEON E. GROUT.

East Jamaica, Vt., Sept. 30, 1920.

LIVED ONE WINTER IN ILLINOIS.

Tell Father Root that I had 38 stalks of annual sweet clover from seed sent last year, and it didn't die out the last winter, and I have gathered 12 pounds of seed the first seeding, and will get more the next crop as I didn't cut the stalks down. It bloomed again, and it was a sight to look at the ripe seed. Between the seed stems new blossoms came; but I stripped it to get the seed, and now the second crop is getting ripe.

Rio, Ill., Oct. 27, 1920. A. N. COOKE.

THE NEW ANNUAL SWEET CLOVER. SCARCITY OF SEED.

The letter below explains itself:

Dear Sirs: I am mighty sorry, but we are going to have to discontinue our advertising of the new Annual White Sweet Clover, unless we can secure a further supply of the seed somewhere.

Our own growing of seed is all sold now except a very small amount, and unless we can get some more dependable seed somewhere we will have to go to refunding money on the orders.

Do you have any idea where we can pick up any more seed? Henry Field Seed Co.
By Henry Field, Pres.

Shenandoah, Iowa, Dec. 3, 1920.

In view of the above, if any of our readers have any seed to spare we will give a free notice of it; but, if the party is not known, reference should accompany the ad. As the seed of the old biennial looks exactly *like* the new, mistakes might be made thru ignorance or otherwise. We hope to be able to send right along very small free packets.

Classified Advertisements

Notices will be inserted in these classified columns for 30c per line. Advertisements intended for this department cannot be less than two lines, and you must say you want your advertisement in the classified column or we will not be responsible for errors. Copy should be received by 15th of preceding month to insure insertion.

REGULAR ADVERTISEMENTS DISCONTINUED IN GOOD STANDING.

(Temporary advertisers and advertisers of small lots, when discontinued, are not here listed. It is only regular advertisers of regular lines who are here listed when their advertisements are discontinued when they are in good standing.)

Edw. A. Winkler, M. Voinche, Fred Telshow, P. W. Sowinski, N. B. Quirin, E. C. Pike, Nevada Honey Co., Ward Lamkin, E. A. Harris, H. B. Gable, Chalon Fowls & Co., B. B. Coggshall, J. B. Brockwell.

HONEY AND WAX FOR SALE

FOR SALE—Very choice white clover extracted honey in 60-lb. cans. Noah Bordner, Holgate, Ohio.

FOR SALE—Choice white clover honey in 60-lb. cans—none finer. J. F. Moore, Tiffin, Ohio.

FOR SALE—Light amber honey in cans or half barrels, at 17c per pound. F. C. Ries, Macon, Ga.

FOR SALE—Clover and buckwheat honey in 60-lb. cans. Bert Smith, Romulus, N. Y.

FOR SALE—Fine quality well-ripened honey from the wild flowers of Old Kentucky in 60-lb. cans. Sample 25c. Adam Kalb, Brooksville, Ky.

FOR SALE—White clover and basswood blend honey in new 60-lb. cans, two in case. Sample 20c. Geo. M. Sowarby, Cato, N. Y.

FOR SALE—White and amber honey in 5-lb. pails, packed in cases of 12.
R. C. Wittman, St. Marys, Pa.

FOR SALE—Fancy clover honey in 60-lb. cans. Sample, 15c.
Jas. Hanke, Port Washington, Wisc.

FOR SALE—Clover honey with slight basswood blend, new 60-lb. cans; also buckwheat, 60-lb. cans.
H. F. Williams, Romulus, N. Y.

FOR SALE—Fine quality buckwheat honey for table use in 60-lb. cans, 5 and 10 lbs. pails.
E. L. Lane, Trumansburg, N. Y.

FOR SALE—Clover-basswood honey in 60-lb. cans. Also some buckwheat, sample 25c.
Kenneth Gallant, Cato, N. Y.

FOR SALE—Choice clover extracted honey in 60-lb. cans, $21.50 per case of two cans. Write for price on large quantities. J. D. Beals, Oto, Iowa.

FOR SALE—Well-ripened, thick and rich white-aster honey in 120-lb. cases at 18c f. o. b. Brooksville, Ky. Sample 25c. H. C. Lee, Brooksville, Ky.

For best table honey try a case of Weaver's sweet clover Spanish needle blend, none better. Price 18c in 60-lb. cans. Joe C. Weaver, Cochrane, Ala.

FOR SALE—White clover honey, almost water white. Put up in new 60-lb. tin cans, two to the case. Write for prices.
D. R. Townsend, Northstar, Mich.

FOR SALE—Finest Michigan raspberry, basswood, and clover honey in 60-lb. cans, 25c per pound. Free sample.
W. A. Latshaw Co., Clarion, Mich.

FOR SALE—20 cases buckwheat comb No. 1 and No. 2 grade, at $6 and $5 per case of 24 sections.
H. G. Quirin, Bellevue, Ohio.

FOR SALE—Honey of a basswood and clover grade, put up in 60-lb. cans, 18c per pound, f. o. b. here. Sample 20c. W. M. Peacock, Mapleton, Iowa.

FOR SALE—Finest Michigan basswood and clover honey, well-ripened, and of good flavor, put up in 60-lb. cans. A. S. Tedman, Weston, Mich.

FOR SALE—First-quality clover and basswood honey at 20c, buckwheat at $20.00 per case. In new 60-lb. cans. Howard H. Choate, Romulus, N. Y.

WRITE O. H. Schmidt, R. D. No. 5, Bay City, Mich., for prices on honey of exceptional quality, put up in 60-lb. and 5-lb. cans. Sample, 10c.

FOR SALE—White honey in 60-lb. cans, sample and price on request. Also white clover comb, 24 sections to case. The A. I. Root Co., Inc., 23 Leonard St., New York City.

FOR SALE—New water white sage honey, two 60-lb. cans to case, 20c lb. net; light amber Haitian, 440-lb. barrels, 11c lb. net f. o. b. New York.
Hoffman & Hauck, Inc., Woodhaven, N. Y.

WHOLESALE prices to beekeepers for their winter trade, extracted alfalfa sweet-clover honey in 60-lb. cans, 16c per pound.
Foster Honey & Merc. Co., Boulder, Colo.

Extracted honey. New crop white sage, white orange 20c a lb., L. A. alfalfa 15c, white Haitien 12c, amber 11c, Chilian 10c. Beeswax 30c. Walter C. Morris, 105 Hudson St., New York City.

FOR SALE—10,000 lbs. A1 quality white sweet clover honey, in new 60-lb. cans. Will sell in quantities to suit. Sample free.
W. D. Achord, Fitzpatrick, Ala.

FOR SALE—Clover, basswood or buckwheat honey, comb and extracted, by the case, ton, or carload. Let me supply your wants with this fine N. Y. State honey. C. B. Howard, Geneva, N. Y.

FOR SALE—3000 lbs. of well-ripened clover honey at 20c per lb.; 12,000 lbs. of No. 1 white aster honey at 15c per lb., put up in 60-lb. cans f. o. b. Brooksville, Ky. Sample 25c.
W. B. Wallin, Brooksville, Ky.

FOR SALE—Buckwheat-red clover blend honey at 17c a lb. and fine white clover and basswood honey at 22c a lb. in new 60-lb. cans, two to the case, f. o. b. here.
Albert Borning, Hayts Corner, N. Y.

FOR SALE—Well-ripened extracted clover honey, 20c per pound; buckwheat and dark amber, 17c, two 60-lb. cans to case. Clover in 5-lb. pails, $1.25 per pail; buckwheat and amber, $1.00 per pail, packed 12 pails to case, or 30 to 50 pails to barrel. H. G. Quirin, Bellevue, Ohio.

FOR SALE—Michigan extracted honey in carloads or less. Our honey is of extra-good body and color this year. Producers should write for prices of glass and tin containers and maple syrup cans. Michigan Honey Producers' Exchange, E. Lansing, Mich.

FOR SALE—Clover extracted honey of unsurpassed quality; new cans and cases, prompt shipment You will be pleased with "Townsend's quality" extracted honey. Not a single pound extracted until long after the flow was over; thus the quality. Would advise intending purchasers to order early, as we have only a half crop. Address with remittance.
E. D. Townsend & Sons, Northstar, Mich.

HONEY AND WAX WANTED

BEESWAX WANTED—For manufacture into SUPERIOR FOUNDATION. (Weed Process.)
Superior Honey Co., Ogden, Utah.

WANTED—Bulk comb, section, and extracted honey. Write us what you have and your price.
J. E. Harris, Morristown, Tenn.

BEESWAX wanted. Will pay highest market price. State quantity you have, and price wanted.
M. E. Ballard, Roxbury, N. Y.

WANTED—Beeswax. We are paying 1 and 2c extra for choice yellow beeswax, and in exchange for supplies we can offer a still better price. Be sure your shipment bears your name and address, so we can identify it immediately upon arrival, and make prompt remittance.
The A. I. Root Co., Medina, Ohio.

We buy honey and beeswax. Give us your best price delivered New York. On comb honey state quantity, quality, size, weight per section, and sections to case. Extracted honey, quantity, quality, how packed and send samples.
Chas. Israel Bros. Co., 486-490 Canal St., New York City.

FOR SALE

HONEY LABELS—New designs. Catalog free.
Eastern Label Co., Clintonville, Conn.

FOR SALE—A full line of Root's goods at Root's prices A. L. Healy, Mayaguez, Porto Rico.

ROOT'S goods at Root prices. A. W. Yates, 3 Chapman St., Hartford, Conn.

FOR SALE—Second-hand 60-lb. cans, 2 to a case, 30c a case. I. J. Stringham, Glen Cove, N. Y.

FOR SALE—One-pound jars in two-dozen cases, ten cases or more at $1.75 per case, f. o. b. factory. A. G. Woodman Co., Grand Rapids, Mich.

FOR SALE—Annual sweet-clover seed, garden-grown, hand-stripped, 1 oz., 50c. Supply limited. Order early. S. Rouse, R. D. No. 2, Ludlow, Ky.

FOR SALE—SUPERIOR FOUNDATION, "Best by Test." Let us prove it. Order now.
Superior Honey Co., Ogden, Utah.

ROOT'S BEE SUPPLIES—For the Central Southwest Beekeeper. Beeswax wanted. Free catalog. Stiles Bee Supply Co., Stillwater, Okla.

FOR SALE—One Ever Ready Starting and Lighting outfit, for Ford Cars, $25.00.
E. E. Lawrence, Doniphan, Mo.

FOR SALE—Good second-hand empty 60-lb. honey cans, two cans to the case, at 60c per case f. o. b. Cincinnati. Terms, cash with order. C. H. W. Weber & Co., 2146 Central Ave., Cincinnati, O.

WILL last a lifetime—new one-piece covers made from beautiful clear cypress well seasoned. Five or more, 60c each.
A. J. Heard, 320 Calvert Ave., Detroit, Mich.

FOR SALE—To reduce stock, crates of 96 one-gallon cans, with bails and three-inch screw caps, at $17.50 per crate f. o. b. Grand Rapids.
A. G. Woodman Co,, Grand Rapids, Mich.

PORTER BEE ESCAPES save honey, time and money. Great labor-savers. For sale by all dealers in bee supplies.
R. E. & E. C. Porter, Lewistown, Ills.

FOR SALE—100 twin-mating boxes, $1.00 each. Nailed and painted, and complete except for foundation. Used one season.
Geo. A. Hummer & Sons, Prairie Point, Miss.

Sell your wares with Sign Boards, the silent salesmen. Plan now to sell next year's crop with them. Signs made to order. Prices reasonable. Satisfaction guaranteed. Investigate.
H. A. Schaefer, Osseo, Wisc.

FOR SALE—One 30-30 Marlin rifle with telescope sights and reloading outfit, used very little. $35.00. E. E. Lawrence, Doniphan, Mo.

FOR SALE—Good second-hand double-deck comb-honey shipping cases for 4¼ x 4¼ x 1⅞ sections, 25c per case, f. o. b., Cincinnati. C. H. W. Weber & Co., 2146 Central Ave., Cincinnati, Ohio.

HAVE sold all my bee supplies. Received so many answers to my advertisement in December Gleanings that I thought it would be best to put a notice in January Gleanings.
H. C. Green, 939 West River, Elyria, Ohio.

FLORIDA BEEKEEPERS—You can save money by placing your order for Root's Bee Supplies with us. We carry the complete line. Will buy your beeswax. Write for catalog.
Crenshaw Bros. Seed Co., Tampa, Fla.

SPECIAL 5-GAL. CANS. Have 300 cases left perfect Calif. used 5-gal. cans, 2 to case, heavy wood large screw cap cans. Will close out to first buyers. 60c case. Order quick.
Hoffman & Hauck, Inc., Woodhaven, N. Y.

FOR SALE—5000 fences for 4 x 5 x 1⅜ sections to be used with slats, $4.00 per 100; 50 ten-frame Danzenbaker comb honey supers, nailed and painted, good as new, $2.00 each; 500 Alexander feeders, 30c each, f. o. b. Montgomery.
J. M. Cutts, Montgomery, Ala.

FOR SALE—500 pounds of Dadant's light brood foundation for Hoffman frames, put up in boxes holding 50 pounds net. This foundation is in the best of shape, the same as I received it. I will not accept orders for less than one box. Price, 75c per pound. M. E. Eggers, Eau Claire, Wisc.

FOR SALE—Root's Extractors and Smokers, Dadant's Foundation, and a full line of Lewis' Beeware. Our new price list will interest you. We pay 38c cash, and 40c in trade for clean yellow beeswax delivered in Denver. The Colorado Honey Producers' Association, 1424 Market St., Denver, Colo.

FOR SALE—An old good book, "The Winter Care of Horses and Cattle," by a great farmer, the late T. B. Terry. Mr. A. I. Root urged Mr. Terry to write this book, and he wrote the publisher's preface for the work. Any one who owns a cow or horse should own this book. We now have left only 150 copies of this paper-covered booklet of 50 pages. These we will sell to the first 150 people who send us 20c for a copy.
The A. I. Root Co., Medina, Ohio.

FOR SALE—The following used goods in excellent condition, Root make: One Hatch wax press, single, price, $12.50; one honey galvanized storage tank, 60-gal. capacity, price, $14.00; one two-frame Cowan, hand-reversible honey extractor, price $24.00. We require a larger outfit. Also one Oliver No. 5 typewriter, good as new, and including steel cover case, price $19.50. Brand-new Wisconsin white pine, standard dovetailed ten-frame hive-bodies with full sheets medium foundation, wired, in Hoffman frames, including rabbets, nailed but not painted, singly, price, $5.00; in lots of ten, $4.25, or the lot of 50 at $4.00. These were bought in excess of our needs.
J. B. Hollopeter, Queenbreeder, Rockton, Pa.

AUTOMOBILE REPAIRS

AUTOMOBILE owners should suscribe for the AUTOMOBILE DEALER AND REPAIRER; 150-page illustrated monthly devoted exclusively to the care and repair of the car. The only magazine in the world devoted to the practical side of motoring. The "Trouble Department" contains five pages of numbered questions each month from car owners and repairmen which are answered by experts on gasoline-engine repairs. $1.50 per year. 15 cents per copy. Postals not answered. Charles D. Sherman, 107 Highland Court, Hartford, Conn.

WANTS AND EXCHANGE

WANTED—Several bee-outfits (preferably near home). H. G. Quirin, Bellevue, Ohio.

WANTED—Second-hand extractor. R. B. Smith, Villisca, Iowa.

WANTED—Hives of bees, Italian, 10-frame, any quantity. J. S. McKessock, Sudbury, Ont.

WANTED—Second-hand 10-frame Standard hives. R. B. Smith, Villisca, Iowa.

WANTED—A good honey location and bee outfit. Delbert Lhommedieu, Colo, Iowa.

WANTED—50 colonies of bees of any breeding. Bees from Minnesota preferred.
Herman Voller, Aitkin, Minn.

WANTED—Back numbers of Gleanings in Bee Culture from January, 1899, to June, 1920.
W. H. Humphries, Midvale, Va.

BEESWAX wanted. Old combs (dry) and cappings for rendering. Also wax accepted in trade. Top market prices offered.
A. I. Root Co. of Iowa, Council Bluffs, Iowa.

WANTED—Old combs and cappings for rendering on shares. Our steam equipment secures all the wax. Superior Honey Co., Ogden, Utah.

WANTED—Shipments of old combs and cappings for rendering. We pay the highest cash and trade prices, charging but 5c a pound for wax rendered. The Fred W. Muth Co., Pearl and Walnut Sts., Cincinnati, O.

WANTED to correspond with parties having bees in 10-frame standard hives, that will lease them on shares. Will give good contract and references. Have a good location in southwest Iowa.
W. A. Jenkins, 144 Simmons St., Galesburg, Ills.

WANTED—Second-hand Buckeye double-walled hives made by A. I. Root Co., without combs or supers, also Cowan rapid reversible extractor that is in perfect condition.
Chas. C. Mackay, 147 Asheland Ave., Asheville, N. C.

WANTED—To buy 300 two-pound packages of three-banded leather-colored Italian bees, and 300 select untested queens. Must guarantee safe delivery and deliver June 1, 1921. Give reference.
N. E. Woodhouse, Merrill, Oregon.

OLD COMBS WANTED—Our steam wax-presses will get every ounce of beeswax out of old combs, cappings, or slumgum. Send for our terms and our new 1920 catalog. We will buy your share of the wax for cash or will work it into foundation for you. Dadant & Sons, Hamilton, Illinois.

BEES AND QUEENS

Finest Italian queens. Send for booklet and price list. Jay Smith, R. D. No. 3, Vincennes, Ind.

Hardy Italian queens, $1.00 each.
W. G. Lauver, Middletown, Pa.

GOLDEN Italian queens, untested, $1.50 each; dozen, $14.00. E. A. Simmons, Greenville, Ala.

PACKAGE BEES and PURE ITALIAN QUEENS. Booking orders now for spring delivery. Circular free.
J. E. Wing, 155 Schiele Ave., San Jose, Calif.

I offer my 65 colonies bees, all in safe winter quarters, 70 miles from Sioux City. Promising field, sweet clover abundant. If paid for now I would turn a pleasant business situation to buyer. Urgent reasons for selling. Write quick.
J. W. Cameron, Davis, S. D.

FOR SALE—25 stands of bees, price $200.00. Homemade hives. No disease. Address
A. P. Applegate, Pineland, Fla.

ORDERS booked now for 1921 shipments of bees and queens. Send for descriptive circular and price list. R. V. Stearns, Brady, Texas.

FOR SALE—A. I. Root Co. strain of leather-colored Italians. Virgins only, May to October. 1, 75c; 10, $7.00; 100, $65.00.
P. W. Stowell, Otsego, Mich.

BEES BY THE POUND — Also QUEENS. Booking orders now. FREE circulars give details. See larger ad elsewhere. Nueces County Apiaries, Calallen, Texas. E. B. Ault, Prop.

FOR SALE—3 pounds of bees, a frame of brood and honey, and an untested Italian queen for $7.00. 25 per cent down books your order for spring delivery. Emile J. Beridon, Jr., Mansura, La.

FOR SALE—12 colonies Italian bees in 10-frame Root hives together with over $200 worth of supplies. $200 takes the lot. Write me if interested.
R. W. Gronemeier, Mt. Vernon, Ind.

ITALIAN QUEENS OF WINDERMERE are superior three-banded stock. Untested, $1.50 each; six for $8.00; tested, $2.50 each; select tested, $3.00. Prof. W. A. Matheny, Ohio University, Athens, Ohio.

I am ready now to book your orders for bees in 2 and 3-pound packages for next May and June delivery, also 3-banded Italian queens and nuclei. Write for price list. C. H. Cobb, Belleville, Ark.

FOR SALE—150 colonies in two-story eight-frame hives, best combs, $15.00 per colony, good condition, April 1. Same equipment half catalog price. This will not appear again.
Daniel Danielsen, Brush, Colo.

FOR SALE—Vigorous leather-colored Italian queens, famous three-banded stock. Bees in two and three-pound packages. Write for information and prices for 1921. Shipments begin about May 1.
C. M. Elfer, St. Rose, La.

FOR SALE—Root's strain of golden and leather-colored Italian queens, bees by the pound and nuclei. Untested, $1.50 each; select untested, $2.00; tested, $2.50 each; select tested, $3.00. For larger lots write. Circular free.
A. J. Pinard, 440 N. 6th St., San Jose, Calif.

WE believe we have the best Italian queens obtainable. Our new system is working wonders. Book your order now for 1921. Untested, $1.50; tested, $3.00. F. M. Russell, Roxbury, Ohio.

DAY-OLD QUEENS—Superior improved Italians. Mailed in safety-introducing cages. Safe arrival and satisfaction guaranteed anywhere in the U. S. and Canada. Send for circular. Order in advance. Prices, April to October: 1, 75c; 12, $7.20; 100, $60. James McKee, Riverside, Calif.

1921 price of bees and queens from the A. I. Root Co. leather-colored stock. 1 lb. bees with queen, $5.00; 2 lbs. $7.50. Untested queens, $1.50 each; dozen, $15.00. Safe arrival. Orders booked now.
Greenville Bee Co., Greenville, Ala.

FOR SALE—Nuclei of Italian bees and Italian queens. Two-frame nucleus with queen, $7.00; 3-frame nucleus with queen, $8.50; one untested queen, $1.50; tested queen, $2.50. Terms, one-half down.
Frank Bornhoffer, Mt. Washington, Ohio.

FOR SALE—Pure Italian queens, Golden or leather-colored, packages and nuclei; 1 untested queen, $1.50; 6, $7.50; 12, $13.50; 50, $55.00; 100, $100; virgins, 50c each; packages 24 and under, $2.25 per pound; 25 and over, $2.00 per pound; nuclei, 1-frame, $4.00; 2-frame, $6.00; 3-frame, $7.50; queens extra. One-story 10-frame colony with queens, $12.00. Golden Star Apiaries, R. 3, Box 166, Chico, Calif.

We are now booking orders for early spring delivery of two and three frame nuclei, with untested or tested queens. Write for prices and terms. We also manufacture cypress hives and frames.
Sarasota Bee Co., Sarasota, Fla.

I am now booking orders for three-banded Italian queens and nuclei for spring delivery. Untested queens. April 1 to May 1, $1.25 each. May 1 to July 1, $1.00. Discount on large orders. Nuclei, one three-frame, $4.50; 50 or more, $4.00 each.
L. R. Dockery, Carrizo Springs, Texas.

FOR SALE—Three-band leather-colored Italian bees and queens, two-pound packages only. Shipping season from April 15 to May 20. Safe arrival and satisfaction guaranteed. No disease. Order early if you wish prompt delivery. Write for price list.
J. M. Cutts, Montgomery, R. D. No. 1, Ala.

FOR SPRING DELIVERY—One good Italian queen, 1 Hoffman standard frame emerging brood, 1 pound live bees, price complete, $6.50, f. o. b. Bordelonville. Queen introduced, mated, laying en route; loss in transit replaced if noted on express tag by agent; no disease in State. References given. Orders booked, May delivery, one-fifth cash; orders filled in rotation. Jess Dalton, Bordelonville, La.

WE are now booking orders for 3-lb. packages for May delivery. 3-lb. package with untested queen, $7.00; 3-lb. package with tested queen, $8.00. Orders booked as received. Safe delivery, satisfaction, and no disease guaranteed. All bees shipped on a comb of brood and honey. 50 per cent down will book your order. J. L. St. Romain, White Clover Farm & Apiary, Hamburg, La.

FOR SALE—1921 prices on nuclei and queens. 1-frame nucleus, $3.00; 2-frame nucleus, $5.00; 3-frame nucleus, $6.50, without queens, f. o. b. Macon, Miss. 5 per cent discount in lots of 25 or more. Untested queen, $1.25 each; $15.00 per doz.; tested, $2.00 each; $22.00 per doz. No disease. Inspection certificate with each shipment. Safe arrival and satisfaction guaranteed in U. S. Queens sold only with nuclei.
Geo. A. Hummer & Sons, Prairie Point, Miss.

HELP WANTED

WANTED—An up-to-date beeman for 1921.
R. S. Becktell, Rifle, Colo.

WANTED—A young man to work in my apiaries for season. Will furnish board. State wages wanted in first letter. J. W. Sherman, Valdosta, Ga.

WANTED—Queen-breeder who understands the business in queen-rearing for the season of 1921.
M. S. Nordan, Mathews, Ala.

WANTED—Young man to learn queen and package business, will pay small wages and furnish board. Will increase wages as party learns business. To begin March 1.
J. M. Cutts, Montgomery, R. D. No. 1, Ala.

WANTED—Married man to work with bees and poultry, house and garden furnished. State experience had, age, weight, and height. Also wages expected. Reference required. Also one single man wanted. E. L. Lane, Trumansburg, N. Y.

HELP WANTED—Will give experience and fair wages to active young man not afraid of work, for help in large, well-equipped set of apiaries for season, starting in April. State present occupation, weight, height, age, and beekeeping experience, if any. Morley Pettit, The Pettit Apiaries, Georgetown, Ont.

WANTED—Two helpers, one with experience, begin in March, for 700 colonies of bees. Give age, experience, wages wanted, recommendations, etc. Can sell an apiary so you can work it out. May lease all on shares after August.
Box No. 2, R. D. 1, El Centro, Calif.

WANTED for the season of 1921 an experienced queen-breeder. State experience had, reference, age, height, weight.
W. J. Forehand & Sons, Ft. Deposit, Ala.

SITUATIONS WANTED

YOUNG man, some experience, wants work on bee farm. Write E. Ehrgott, R. D. 5, West Allis, Wis.

SITUATION wanted by experienced beeman. Shares or salary. Good references. State conditions in first letter. Nelson B. Armstrong, Groton, N. Y.

WANTED—Position with bees or poultry, or combined. 20 years' experience. Would rent same on shares. Would go 50-50 with good reliable parties wishing to engage in bees and poultry enough to keep both occupied. Will give satisfactory references. Warren Fanning, 366 Norton St., Elmira, N. Y.

Books and Bulletins

CO-OPERATIVE MARKETING.

Farmers' Bulletin 1144, United States Department of Agriculture, "Co-operative Marketing," should be of special interest to those beekeepers who are interested in marketing honey co-operatively. This bulletin tells under what conditions co-operative marketing may be expected to be successful, and under what condition it should not be attempted. The forms of organization, the selection, and the qualifications of the management are discussed, and suggestions are given for organizing co-operative associations. This bulletin can be secured free by writing the Department of Agriculture, Washington, D. C.

ALSIKE CLOVER.

Farmers' Bulletin 1151, on Alsike Clover, recently issued by the United States Department of Agriculture, is filled with valuable information in regard to this excellent honey plant. It contains a map of the United States showing where alsike clover is regularly used as a forage or seed crop. The author states that in many of the northern States this clover is sown on probably 75 per cent of the clover and timothy acreage. The mixing of alsike and red clover is recommended wherever it is difficult to get a stand of red clover, thus insuring a stand on spots where red clover does not catch. It is pointed out that a mixture of alsike clover with timothy or red clover when grown for hay gives a greater yield than when either is grown alone, besides improving the quality of the hay. A wide distribution of this bulletin among farmers thruout the alsike-clover territory should be a great boon to beekeepers in this region. This bulletin may be had for the asking by writing to the United States Department of Agriculture, Washington, D. C.

SPECIAL SALE OF PRIVATE TUMBLERS

6½ Oz. Private Tumbler.

We have a surplus stock of private tumblers, holding 6½ ounces, put up two dozen in a case, including tin tops, at our Philadelphia branch. The cost of these tumblers has more than doubled in the past three years. We offer for a short time the surplus stock, available at 80c per case, $7.50 for 10 cases, $70.00 for 100 cases. Prices F. O. B. Philadelphia.

Send your order direct to

THE A. I. ROOT CO.,
Medina, Ohio.

Announcement to

Texas and the Great Southwest Beekeepers

The A. I. Root Co. of Texas

has completed a year's preparation for

FULL ROOT SERVICE from San Antonio, Texas.

The only reason that justifies the existence of any commercial concern is the good work it performs in public service.

The success of The A. I. Root Company is the result of service rendered.

QUALITY that stands the test.
PRICES always consistent with costs.

Large and complete stocks in

SAN ANTONIO

A railroad center. Central to the honey belt of Texas. Almost over-night service to the Texas beekeepers.

The A. I. Root Co. of Texas
Box 765, San Antonio, Texas.

LISTEN BEEKEEPERS

We wish to tell the readers of Gleanings that the Bank of Perris has taken over about 500 hives of bees which we wish to sell as follows:

Nuclei Will Be Our Specialty.

One frame with queens, $3.00; 2 frames and queen, $5.00; one pound with queen, $2.50; 2 pounds and queen, $4.00; 8-frame Single-story colonies, $10.00, F. O. B. Perris.

Young laying queens, $1.50 each; $8.00 for 6; $15.00 per dozen; 50 to 100 or more, $1.00 each.

We have a man in charge with long experience in bee-shipping. Let us book your orders with 10 per cent with same, balance when bees are wanted. Ask for special prices on large order. Shipping season begins May 10th. Safe arrival and satisfaction.

Address

BANK OF PERRIS
PERRIS, CALIF.

Grand Central Headquarters for the Newest Creations and Special Selections in Seeds

THE BEST OR NONE

The earliest, sweetest, and best-flavored tomato in the world—the ''Burbank.''

A wonderful new sunflower—''Prolific White.''

New field, pop, sweet, and ''Rainbow Corn.

New Sweet Cucumbers.

New Hybrid Artichokes.

''Quality'' Asparagus.

New, earliest, white, first-prize wheat, 15 per cent gluten.

New and specially selected flowers, also rare new Gladiolus, Cannas, etc., etc.

All are grown on my California farms under my own personal supervision. These seeds are not the common kind.

List your name now for January catalog.

Luther Burbank - Santa Rosa, California

Quality Bee Supplies From a Reliable House

¶ Without fear or favor I place my BEE WARE and SERVICE before you.

¶ It is the small annoyances that often grow into disastrous results. Avoid the so-called ''little losses'' by using MONDENG'S goods. Quality is first—save time when you put your goods together by getting supplies that are accurately made. Service is next—no delays when bee supplies are ordered from my factory.

¶ I am ready to meet your urgent needs. Send for my latest price-list.

¶ Closing out all Langstroth and Wisconsin hives and supers. Also Langtroth triangular top-bar frames, and eight-frame D. T. supers for 4 x 5 sections. At cost price, write for quotations.

Charles Mondeng

146 Newton Ave. N. &
159 Cedar Lake Road.
MINNEAPOLIS, MINNESOTA.

They Always Come Back For More

All beekeepers who once buy my comb foundation are sure to come back for more, because they find the quality all that can be desired and the price lower than they must pay elsewhere.

Not only do they re-order time after time, but they pass the good news around among their neighboring beekeepers. Here is one way it is done:

> "In filling the position of Pennsylvania State Apiary Adviser, or, as commonly termed, 'bee inspector,' I have recommended your make of foundation a great many times. In our apiaries we have used hundreds of pounds of your make of foundation, as well as all other prominent makes, and in quality yours is the equal of the best. In exactness of cut, and dimensions, yours surpasses them all."—O. L. Rothwell, Gillett, Pa., Nov. 11, 1920.

Your own wax worked into foundation at lowest rates. Send for price list.

E. S. Robinson

Mayville, Chau. Co., N. Y.

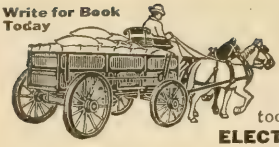
WESTERN BEEKEEPERS

We're glad to know that the pressure their increasing patronage demanded resulted in the establishment of a Branch of the Root Company at Council Bluffs, Iowa, the focal point of western shipping activities.

The first season's business here has more than justified the contention of the Root Company, that western honey producers must have a factory and a center of their own. The Council Bluffs Branch wishes to thank publicly the many beekeepers for their expressions of interest in us, and their hearty welcome; and to state, also, that it is the determination of this company to keep everlastingly at this business of maintaining the high quality of the Root goods, and of improving—always improving—the promptness and thoroughness of our service. We are here to save you money, and to serve you. Use us.

THE A. I. ROOT COMPANY OF IOWA

Council Bluffs, Iowa



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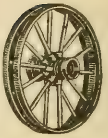
FARM WAGONS

High or low wheels—steel or wood—wide or narrow tires. Steel or wood wheels to fit any running gear. Wagon parts of all kinds. Write today for free catalog illustrated in colors.

ELECTRIC WHEEL CO., 23 Elm Street, Quincy, Ill.



INDIANOLA APIARY

will furnish 3-banded Italian bees and queens: Untested queens, $1.00 each; tested, $1.50 each. One pound bees, no queen, $2.00. No disease.

J.W.SHERMAN,VALDOSTA,GA.

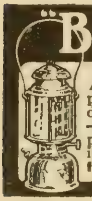
NEW ENGLAND

BEEKEEPERS will find a complete stock of up-to-date supplies here. Remember we are in the shipping center of New England. If you do not have a 1920 catalog send for one at once.

H. H. Jepson, 182 Friend St., Boston, Mass.

"Best" Hand Lantern

A powerful portable lamp, giving a 300 candle power pure white light. Just what the farmer, dairyman, stockman, etc. needs. Safe—Reliable—Economical—Absolutely Rain, Storm and Bug proof. Burns either gasoline or kerosene. Light in weight. **Agents wanted. Big Profits. Write for Catalog.** THE BEST LIGHT CO. 306 **E. 5th St., Canton, O.**



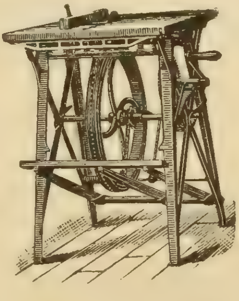
BARNES' Hand and Foot Power Machinery

This cut represents our combined circular saw, which is made for beekeepers' use in the construction of their hives, sections, etc.

Machines on Trial

Send for illustrated catalog and prices.

W. F. & JOHN BARNES CO
545 Ruby Street
ROCKFORD, ILLINOIS



ROSES

of New Castle

Are the hardiest, fresh blooming rose plants in America. Grown on their own roots in the fertile soil of New Castle. We give you the benefit of a life time experience and the most select list in America. Every desirable Rose now cultivated in America is included in our immense stock and the prices are right.

Our rose book for 1921 ROSES OF NEW CASTLE tells you how to make rose growing a success. Published and elaborately printed in actual colors. Send for your copy today—a postal will do.

HELLER BROS. CO., Box 118, New Castle, Ind.

9-oz. Taper Jar

SPECIAL SALE OF

HONEY JARS

We have a surplus stock of taper jars, holding 9 ounces, put up two dozen in a case, including lacquered tin tops, at our Philadelphia branch. The cost of these jars has more than doubled in the past three years. We offer for a short time the surplus stock available at 85 cents per case, $8.00 for 10 cases, $75.00 for 100 cases. Prices f. o. b. Philadelphia.

Send your order direct to

THE A. I. ROOT COMPANY
Medina, Ohio

Thrifty, Sturdy Trees

You can be sure when you buy Woodlawn grown fruit trees, vines and berry bushes that they are thrifty, vigorous growers and heavy bearers. Our 45 years of successful growing experience has been directed towards producing a wide variety of that kind of stock. We have the exclusive sale of the new Ohio Beauty Apple.

Our extensive line of ornamental shrubs, bushes, and perennials are of the same dependable quality as our trees.

We sell seeds for the vegetable and flower garden. Illustrated 1921 Nursery List contains valuable planting and growing information. Mailed on request.

WOODLAWN NURSERIES
882 Garson Ave. Rochester, N. Y.

New Ohio Beauty Apple

GRASS SEED

FREE SAMPLES **Wonderful Value Wholesale Prices Highest Quality**

Don't fail to investigate these bargains. Recleaned Tested Timothy **$3.95** bu. Sweet Clover unhulled, **$4.50** bu. Alsike Clover & Timothy **$5.85** bu. Sudan Grass 8 1-2c lb. Prices cover some grades of limited quantities. Clover and other Grass & Field Seeds at low prices. All sold subject to State or Government Test under an absolute **money-back guarantee.** We specialize in grass and field seeds. Located to save you money and give quick service. We expect higher prices-Buy now and save big money. Send today for our money-saving Seed Guide, explains all-**free.**

American Mutual Seed Co. Dept. 651 **Chicago, Ill**

VICK'S GARDEN & FLORAL GUIDE *for 1921*

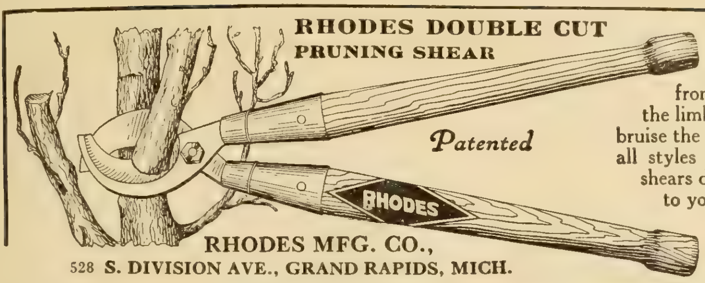
IT'S FREE **A WORTH WHILE BOOK** *WRITE TODAY*

For vegetable growers and all lovers of flowers. Lists the old stand-bys; tells of many new varieties. Valuable instructions on planting and care. Get the benefit of the experience of the oldest catalog seed house and largest growers of Asters in America. For 72 years the leading authority on vegetable, flower and farm seeds, plants, bulbs, and fruits. 12 greenhouses. 500 acres.

Vick Quality Seeds Grow the Best Crops the Earth Produces

This book, the best we have issued, is *absolutely free. Send for your copy today before you forget. A postcard is sufficient.*

JAMES VICK'S SONS, 33 Stone St.
Rochester, N.Y. *The Flower City*



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PRUNING SHEAR**

THE only pruner made that cuts from both sides of the limb and does not bruise the bark. Made in all styles and sizes. All shears delivered free to your door.

Write for circular and prices.

RHODES MFG. CO.,
528 S. DIVISION AVE., GRAND RAPIDS, MICH.

EVERGREENS Hill's Hardy Tested Varieties

Fine for windbreaks, hedges and lawn planting. All hardy, vigorous and well rooted. We ship everywhere. Write for free Evergreen book. Beautiful Evergreen Trees at moderate prices. D. Hill Nursery Co., Box 246, Dundee, Ill.

Best and Newest Fruits

Headquarters for Neverfail, Dunlap, Premier, Oswego, Big Joe, Chesapeake, and 50 other varieties Strawberries; Erskine Park, Plum, Farmer, Idaho, Royal Purple, Columbian, Herbert, and other Raspberries; Snyder, Watt, and other Blackberries; Perfection, Wilder, and other Currants; Doolittle, and other Gooseberries; Grape Vines, Fruit Trees, Asparagus, Seed Potatoes, Roses, Shrubs, Eggs and Baby Chicks, Crates and Baskets, etc. Everything for the Home Grounds. Beautifully illustrated and instructive catalogue free.

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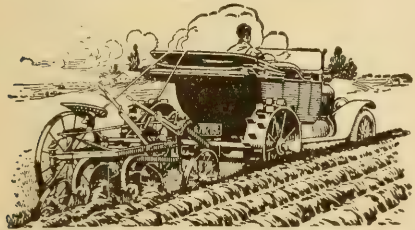

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Use it for farm work. Pullford catalog shows how to make a practical tractor out of Ford and other cars.

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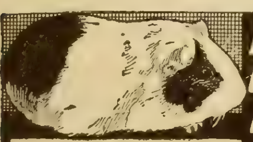

Raise Guinea PIGS FOR US!

We need men and women, boys and girls everywhere to raise Guinea Pigs for us. We tell you where to get them, show you how and buy all you raise. Big opportunity for money making. Thousands needed weekly.

Easy to Raise—Big Demand Large Profits No special knowledge, experience or equipment needed. They breed the year round—are very prolific—require but little space or attention. Pay better than poultry or squabs—cost less to house, feed, keep, easier raised—less trouble, market guaranteed.

Particulars, contract, and booklet how to raise FREE

CAVIES DISTRIBUTING COMPANY
3145 Grand Avenue, Kansas City, Mo.

Largest Guinea Pig breeders and distributors in America.

Queens

Write for our catalog of high-grade Italian Queens. Pure mating and safe arrival guaranteed.

Prices for 1921.

1 to 4 inclusive	$3.00 ea.
5 to 9 inclusive	2.90 ea.
10 or more . . .	2.80 ea.
Breeders	12.00 ea.

Jay Smith

Route Three
Vincennes, Indiana.

Condon's NEW PROSPERITY CABBAGE

Quick as lightning. Hard as stone. One of the earliest in existence. To introduce our **Northern Grown "Sure Crop" Live Seeds** we will mail you 200 seeds of **Condon's New Prosperity Cabbage and our Big 1921 GARDEN and FARM GUIDE** . . . . **FREE**

Send Postal Today for your free copy and Trial Package

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LIVINGSTON'S FAMOUS Tomatoes

Give satisfaction. Stand for highest yield and quality. We originated sorts for all purposes and all tomato growing sections. We grow more tomato seed than any seedsman in the world.

TWO BEST VARIETIES

Livingston's Globe, finest pink, for slicing and shipping, **pkt.** 5c. **Livingston's Stone,** finest bright red, for canning and catsup, **pkt.** 5c. Both immense yielders. Try them.

New 112-Page Catalog FREE

One of the finest seed catalogs published. Gives truthful descriptions and helpful cultural directions of the most reliable sorts of vegetable, flower and field seeds. Tells when to plant and how to grow big crops. Write for Free copy.

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"Special Crops" A high-class illustrated monthly journal devoted to the Growing and Marketing of Ginseng, Golden Seal, Senega Root, Belladonna, and other unusual crops. $1.00 per year. Sample copy 10c. Address

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LARGE, HARDY, PROLIFIC QUEENS

Three-band Italians and Goldens, pure mating and safe arrival guaranteed. We ship only queens that are top-notchers in size, prolificness, and color. Untested, $2.00 each; six for $11.00; twenty-five for $45.00. Tested queens, $3.00 each, six for $16.00.

BUCKEYE BEE CO., Box 443, Massillon, Ohio.

MASON BEE SUPPLY COMPANY

MECHANIC FALLS, MAINE

From 1897 to 1920 the Northeastern Branch of The A. I. Root Company

Prompt and Efficient Service

BECAUSE—Only Root's Goods are sold.
It is a business with us—not a side line.
Eight mails daily.
Two lines of railway.

If you have not received 1920 catalog send name at once.

ROOT'S BEE SUPPLIES.

I can make immediate shipment for early orders, and you can get the discount by ordering early.

A. M. MOORE, Zanesville, Ohio.

22½ South 3rd St.

BEEKEEPERS

No doubt you want to save money on your bee supplies for next spring. Now is a good time to do it. Take advantage of our December discount and write today for prices and catalog. Our prices will save you money. All material and workmanship guaranteed. Texas beekeepers should address A. M. Hunt of Goldthwaite, Texas. He sells the best.

Leahy Mfg. Co.,
Higginsville, Mo.

World's Best Roofing at Factory Prices

"Reo" Cluster Metal Shingles, V-Crimp, Corrugated, Standing Seam, Painted or Galvanized Roofings, Sidings, Wallboard, Paints, etc., direct to you at Rock-Bottom Factory Prices. Positively greatest offer ever made.

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cost less; outlast three ordinary roofs. No painting or repairs. Guaranteed rot-fire, rust, lightning proof.

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Get our wonderfully low prices and free samples. We sell direct to you and save you all in-between dealer's profits. Ask for Book No. 183

LOW PRICED GARAGES

Lowest prices on Ready-Made Fire-Proof Steel Garages. Set up any place. Send postal for Garage Book, showing styles.

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FREE Samples & Roofing Book

PATENTS Practice in Patent Office and Court
Patent Counsel of The A. I. Root Co.

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SWEET CLOVER 4.50 BU.

Unhulled White Blossom Sweet Clover. For winter or early spring sowing. Builds up land rapidly and produces heavy Money Making Crops while doing it. Excellent for pasture and hay. Easy to start. Grows on all soils. Have Hulled Scarified Seed at Low Prices. Sold on a Money Back Guarantee. Write today for Big Seed Guide. **Free.**

American Mutual Seed Co. Dept. 951 **Chicago, Ill.**

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CLOVERS, TIMOTHY

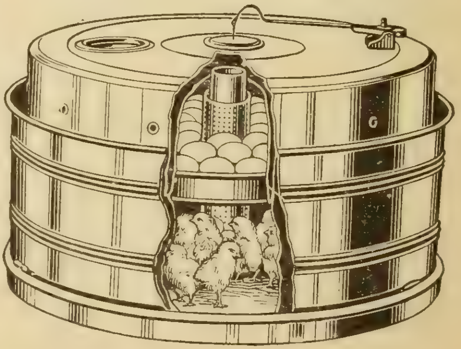
IS THE SIGN OF GOOD SEED

Bell Brand Grass Seeds are the purest, best quality that can be purchased. Specially adapted to your climatic and soil conditions—hardiness bred into them. The development of 42 years' successful seed culture.

FREE Samples and Catalog

Write for Isbell's 1921 Annual—ask for samples of any field seeds you want. Isbell's "direct from grower" prices assure you of big savings on sterling quality seeds — **"seeds that grow as their fame grows."**

S. M. ISBELL & COMPANY (6)
485 Mechanic St. Jackson, Michigan



It's Easy to Raise Poultry With Cycle Brooder-Hatchers.

A NEW idea, combining both Brooder and Hatcher in one machine, one lamp serving both purposes. A real "Metal Mother" that will hatch every hatchable egg, and the chicks will be strong, lively, and easy to raise in the brooder compartment.

YOU can use the Cycle either as a Brooder or Hatcher, or *both at once.* The Cycle is all metal; you can operate it safely in the house or in any outbuilding. You can see the eggs at all times through the round glass window without lifting the top. And you can turn them instantly with a single movement. The regulator control is very sensitive. A gallon of kerosene will usually carry through an entire hatching.

Just the thing for busy farmers and city enthusiasts. 50-egg and 50-chick size $11.00. Two for $20.00.

THE CYCLE HATCHER: Exactly the same as the Brooder-Hatcher, *but without the brooding compartment.* 50-egg size $9.00. Two for $17.00.

WEIGHT: 18 lbs. for parcel post shipment. Postage extra.

CATALOGUE of Hatchers, Brooders, Poultry and Supplies sent free. Send a postal today.

CYCLE HATCHER COMPANY
239 Philo Bldg., Elmira, N. Y.

ORDERS NOW BOOKED

for 1921 shipments of bees and queens. Send for descriptive circular and price list.

R. V. STEARNS,
Brady, Texas.

The "BEST" LIGHT

Positively the cheapest and strongest light on earth. Used in every country on the globe. Makes and burns its own gas. Casts no shadows. Clean and odorless. Absolutely safe. Over 200 styles. 100 to 2000 candle Power. Fully Guaranteed. Write for catalog. AGENTS WANTED EVERYWHERE.

THE BEST LIGHT CO
306 E. 5th St. Canton, O.

BEEKEEPERS!

Place your order for Supplies NOW and take advantage of the Early Order Cash Discount, 5 per cent for December, 4 per cent for January. Our stock of Standard Hives, Supers, Hive Bodies, Brood Frames, Foundation, and all other Standard Goods is complete. "If you want the Cheapest, buy the Best."

Our Aim is to give Prompt Service, Highest Quality, and Guaranteed Satisfaction to our customers. Send us a trial order; we feel confident you will be satisfied.

Our annual catalog will be ready for mailing, January, 1921. It's free for the asking.

AUGUST LOTZ COMPANY, BOYD, WIS.

Queens and Bees When You Want Them

We are establishing one of the most modern Queen-rearing outfits in the United States, and will breed from New Imported Italian Blood. We are not going to tell you how many Queens we will put on the market, as we shall produce QUALITY instead of QUANTITY.

A limited number of orders for spring delivery will be accepted at the following prices:

Quantity.	1	6	12	24
Untested	$2.00	$11.40	$21.60	$40.80
Select Untested	2.25	12.80	24.30	45.90

We are also prepared to furnish full colonies, nuclei, and pound packages for spring delivery. Write today for prices.

THE A. I. ROOT COMPANY OF TEXAS
P. O. BOX 765, SAN ANTONIO, TEXAS.

FOREHAND'S QUEENS---THEY SATISFY, WHY?

Because of 28 years of experimental work, with both queen-breeding and honey-production. With breeding and selecting of imported queens, I have reached a standard which is ideal. Queens as good, but none BETTER. Why experiment? Take advantage of the life experience of my breeders. OUR SERVICE STATION.—We are ready to serve you at all times, whether you desire queens or advice. Let us help you with your bee problems. All questions are cheerfully answered.

I breed three-banded Italians only. Nov. 1st to June 1st.

	1	6	12
Untested	$2.00	$9.00	$16.00
Selected Untested	2.25	10.50	18.00
Tested	3.00	16.50	30.00
Selected Tested	3.50	19.50	36.00

Orders booked now for spring delivery. One-fourth the full amount with order and balance when shipment is desired. Pure mating, safe arrival, and perfect satisfaction guaranteed. Write for circular and large-order discounts. Foreign orders at receiver's risk.

N. FOREHAND - - - - RAMER, ALABAMA

Sell Your Crop of Honey to

Hoffman & Hauck, Inc.

Woodhaven, N. Y.

No Lot too large or small, and Purchase your

Containers, Prompt Shipment

2½-lb. Pails, case 2 doz.....	$1.90	each
Crates of 100	$ 7.25	
5-lb. Pails, case 1 doz.......	$1.80	each
Crates of 100	$11.00	
10-lb. Pails, case ½ doz.....	$1.60	each
Crates of 100	$17.50	
5-gal. cans used 2 to case........	60c	case

WHITE FLINT GLASS JARS, SCREW CAPS

Qt. Honey 3-lb. size	1 doz.	cartons	$1.25	each
1-lb. "	2 doz.	"	1.70	each
½-lb. "	3 doz.	"	2.00	each

The Storrs & Harrison Co.
Painesville, Ohio

READY to mail to you

In this catalog we describe accurately the sturdy-growing varieties that have helped us build one of the largest seed and nursery businesses in the world. For 67 years we have listed only the strains that we were sure deserved our support. S & H seeds and nursery stock will surely please you, however critical you are.

Write—TONIGHT—for your copy of this interesting, well-illustrated catalog.

THE STORRS & HARRISON CO.

Nurserymen and Seedsmen

Box 14 Painesville, Ohi

Completely Destroys the Weed Growth

More than that, the BARKER breaks the hardest crust into a level, porous, moisture-retaining mulch—**all in the same operation.**

A ten-year-old boy can run it—do more and better work than ten men with hoes. Saves time and labor, the two big expense items.

BARKER WEEDER, MULCHER AND CULTIVATOR

Eight reel blades revolve against a stationary underground knife — like a lawn mower. "**Best Weed Killer Ever Used.**" Works right up to plants. Cuts runners. Aerates the soil. Has leaf guards, and shovels for deeper cultivation—3 *garden tools in* 1.

FREE ILLUSTRATED BOOK.

Tells how gardeners and fruit-growers everywhere are reducing their work; increasing their yields.—How to bring growing plants through a dry season.—How to conserve the moisture and force a larger, more rapid growth. Send TODAY for this free, illustrated book and special Factory-to-User offer.

BARKER MANUFACTURING COMPANY

Dept. 23. David City, Neb.

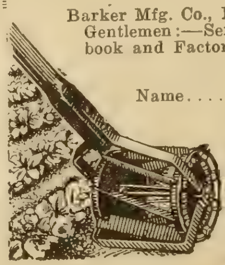
Barker Mfg. Co., Dept. 23, David City, Neb.
Gentlemen:—Send me postpaid your free book and Factory-to-User offer.

Name.........................

Town ....

State ....

R. F. D. or Box........



Beeswax Wanted

In big and small shipments, to keep Buck's Weed-process foundation factory going. We have greatly increased the capacity of our plant. We are paying higher prices than ever for wax. We work wax for cash or on shares.

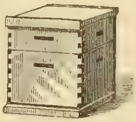
Root Bee Supplies

Big stock, wholesale and retail. Big catalog free.

Carl F. Buck

The Comb-foundation Specialist
August, Kansas
Established 1899.

BEE SUPPLIES



We are prepared to give you value for your money. Our factory is well equipped with the best machinery to manufacture the very best bee supplies that money can buy. Only the choicest material suitable for beehives is used. Our workmanship is the very best. Get our prices and save money.

EGGERS BEE SUPPLY
MFG. COMPANY, INC.

Eau Claire, Wis.

Sow Seeds of Success In Your Garden

Write Today for Isbell's 1921 Catalog

Some vegetable gardens pay their owners $100 in returns for every $5.00 spent. They are a constant source of big profit. They give pleasure to everybody in the home—old and young alike. They yield the finest vegetables and yield lots of them, because they are planted with—

ISBELL'S SEEDS
As they grow their fame grows
1921
S. M. ISBELL & CO.
Jackson, Mich.

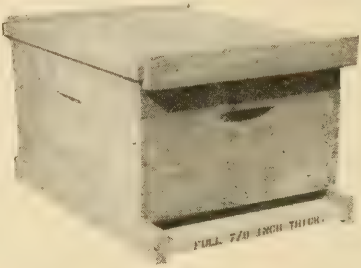
Isbell's Seeds
"As They Grow Their Fame Grows"
For FIELD TRADE MARK **For GARDEN**

Isbell's Gardens Pay—for the same reason that pure-bred cattle produce thoroughbred off-spring. Every ounce of Isbell Seed is tested. Isbell Seeds are produced in the North where earliness, hardiness and sterling qualities are bred into them Isbell's 1921 book on seeds and gardening tells what and how to plant and what to expect from the crop. It's one of the most authoritative catalogs in America. Ask for your copy. Mail coupon.

S. M. ISBELL & CO.
484 Mechanic St., Jackson, Mich.
[2]

Free Catalog Coupon
S. M. Isbell & Co., 484 Mechanic St., Jackson, Mich.
Gentlemen:—
Without obligation, send me your 1921 Catalog of Isbell's Seeds
Name————————————
Address————————————

Made right.



Priced under favorable manufacturing conditions.

Cypress Bee Supplies

On account of being in the cypress belt and having extremely low operating expenses we are able to offer you the supplies made of the finest soft cypress obtainable, which is almost as soft and light as white pine.

Hives are standard dimensions, dovetailed, hand holds on all four sides, supplied with rabbets, nails, and Hoffman frames. Prices include cover, bottom, body, and frames.

A full line of Root's supplies and Airco Foundation kept in stock. Let us quote you on your 1921 requirements in either Root's or our goods.

8-frame 1-story hives complete in lots of 5	$14.75
10-frame 1-story hives complete in lots of 5	16.00

Above supplied with Root-Hoffman frames at $1.50 extra for 5 8-frame, and $1.85 for 5 10-frame.

Hive Bodies.

Eight-frame	$0.95 each
Ten-frame	1.05 each

Bottom-boards are made of ⅞-inch lumber throughout. Floor is tongued and grooved together, reversible, of standard dimensions and construction. Price:

8-frame in lots of 5	$0.75
10-frame in lots of 5	.80

Prices of Bees.

Untested queens: 1, $2.00; 12 or more, 1.50 each. Tested queens, $3.00.

1-lb. package without queen	$4.00
2-lb. package without queen	6.75
2-frame nuclei	7.00
8-frame colony	20.00
10-frame colony	22.00

1 carload bees in 8-frame cypress hives for shipment in spring from Helena, Ga., at $12.50 each.

Covers.

All covers are flat and reversible. Both one and two piece are the same in every respect, except the one-piece is made from wide clear boards and the two-piece is joined with metal. Cypress covers do not warp.

8-frame two-piece	$0.70
10-frame two-piece	.75
8-frame one-piece	.85
10-frame one-piece	1.00

Absolutely the best cover made.

Fresh stock foundation shipped from factory direct to you at wholesale prices in lots of 50 pounds or more.

SEND FOR CATALOGUE.

The Stover Apiaries

Helena, Ga. **Mayhew, Miss.**

For Your Winter Trade

HONEY

WHOLESALE PRICES

16 Cents Per Pound

Extracted Honey
Sixty-Pound Cans

F. O. B. Boulder, Colorado.

NOTE: This honey will be granulated, finest quality, white alfalfa-sweet clover honey, this year's production.

Comb Honey

Crates of 8 cases, 24 sections.

Fancy	$7.25
Number One	7.00
Number Two	6.50

F. O. B. Boulder, Colorado.

The Foster Honey & Merc. Company

Boulder, Colorado.

We are starting in a new year, the year of 1921, and we want to make this the finest of all years, in all respects. What are you planning to do in regard to your bees?

In the FIRST place, you must have supplies. Are you going to order now and have them on hand when needed, or are you going to wait until the bees are flying?

Happy New Year

* * *

F. A. SALISBURY

1631 West Genesee Street
Syracuse, New York

* * *

Send for our price list. Write us for quotations.

In the SECOND place, you want "Service." Now is the time to secure the right kind of service, promptness, and accuracy. When orders are piling up in the rush season we cannot give you our best attention.

In the THIRD place, order now while you are sure of getting your goods on time. Later on, freight will undoubtedly be tied up, and shipments slow in reaching destination.

Place Your "Falcon" Order Early

DELIVERIES will be more certain; everything will be on hand ready for spring. Special discount to early buyers.

Include an Ideal Bee-Veil in this season's supplies. Made of light weight indestructible wire and strong cloth. Will not blow in your eyes or stick to your face. Price $1.60.

"Falcon" bees and bee supplies are guaranteed to give absolute satisfaction. Send for our red catalog.

W. T. Falconer Manufacturing Co.

Falconer (near Jamestown), N. Y., U. S. A.

"Where the best bee-hives come from."

$1.60.

THE AULT 1921 BEE SHIPPING CAGE

Patent Pending.

1st. It is a dark cage, much more so than the open screen cages we have been shipping in in the past.

2nd. The feeder uses pure sugar syrup. Better than Honey or Candy to ship on; it contains water as well as feed.

3rd. Feeders are made more substantial, 1-3 larger, and have screw cap that will not jar out.

4th. Instead of one small hole, we now use a cotton duck washer in the screw cap that has proven to overcome all the objections found to the liquid feed method.

5th. The Cage is one piece screen wire protected by thin boards on the outside.

Send for free circular describing the cage in detail, prices, etc.

Queens---Package Bees---Queens

ORDERS ARE COMING DAILY FOR 1921 SHIPPING.

4 per cent Cash Discount for Nov., 3 per cent for Dec., 2 per cent for Jan. on all orders. Or will book your order with 20 per cent down, balance just before shipping. My Free Circular gives prices in detail, etc. Safe delivery Guaranteed within 6 days of shipping point. We ship thousands of pounds all over U. S. A. and Canada.

1-pound pkg. bees $3.00 each, 25 or more $2.85 each.
2-pound pkg. bees $5.00 each, 25 or more $4.75 each.
3-pound pkg. bees $7.00 each, 25 or more $6.65 each.
F. O. B. Shipping Point. Add price of queen wanted.

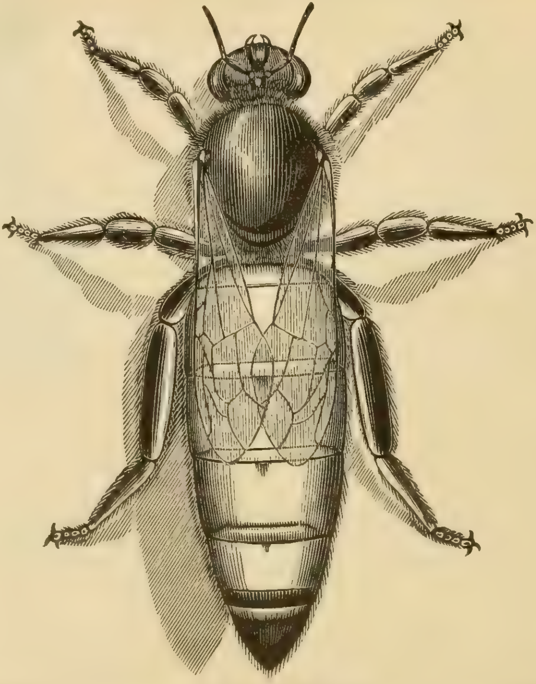
1 Untested Queen, $2.00 each; 25 or more .... $1.75 each
1 Select Unt. Queen, $2.25 each; 25 or more .... $2.00 each
1 Tested Queen, $3.00 each; 25 or more .... $2.70 each
1 Select Tested, $3.50 each; 25 or more .... $3.00 each

NUECES COUNTY APIARIES

CALALLEN, TEXAS

E. B. AULT, Proprietor

My first peep out on the dawn of a new year.



Highest Quality **Prompt Service** **Satisfaction**

The Reliable Three- Banded Italian Queens

We are now booking orders for 1921. Queens will be ready after May 15th, one-fourth down, balance just before shipping date. Place your orders early, as we fill orders in rotation.

WHY ORDER FARMER QUEENS?

They are bred by as skillful and experienced queen-breeders as can be found in the United States. There are very few places where queens are reared under as favorable conditions as in our queen-rearing yards. We devote our time to rearing as good queens as possibly can be, and we positively guarantee that no better can be reared; we spare neither labor nor money in developing our strain of Italians. It is our intention to improve our original stock each year and to be more skillful queen-breeders. Our first original stock was procured from the highest quality obtainable, which we have proved to the highest point and is now not surpassed by any. Our own eyes inspect every queen that leaves our yards; no culls sent out. Place your orders, and after you have given our queens a fair test and you are not satisfied in every way that they are as good as any you have ever used, just return them and we will send you queens to take their places or return your money. They are very resistant to diseases, the very best for honey-gathering. You take no risk in buying our queens; safe arrival in U. S. A. and Canada; satisfaction is left entirely to purchaser; prompt service given to all orders; every queen guaranteed to be purely mated.

Our Prices:	1	6	12	100
Untested	$1.50	$ 8.00	$15.00	$100.00
Select Untested	1.75	9.50	17.00	120.00
Tested	3.00	14.75	25.00	
Select Tested	4.00	23.00	42.00	

Write for prices on larger quantities than 100.

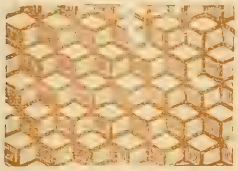
The Farmer Apiaries - - Ramer, Alabama

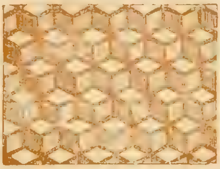
Where the good queens come from.

Airco Foundation--Why?

We are now beginning to get the beekeepers' own verdict on Airco Foundation, the new Root-Weed process, announcement of which we made a year ago and more.

We then told the beekeepers that the new process had to do with both the refining of the wax and the milling of the wax sheets. We said that we believed that we had made one of the greatest of all improvements in the manufacture of comb foundation.


Thin Super.


Light Brood.

Medium Brood.

Today, with reports coming in from beekeepers who have now used this new foundation, we are sure that all the claims we have made for Airco are fully proved Let's have some of the testimony:

Bees Draw It Out Sooner.

"The bees accept it quickly; draw it out with less labor and sooner. I have used over 200 pounds of Airco the past season."

Marietta, N. Y. J. G. Burtis.

Simply Perfection.

"This foundation may be called the crown of all betterments in modern beekeeping. It is simply perfection. The fact is that we need nothing better, and I am convinced that it cannot be surpassed."

Sabanna, Brazil. Victor Jungers.

Far Superior to Any Others.

"Airco Foundation is far superior to any other foundation that I have ever tried. The bees accept it at once, and draw it out into fine worker comb."

Lake Geneva, Wis. C. H. Gebhardt.

We have many such commendations for Airco Foundation. It is only praise that comes from the beekeepers, and so it is that we believe it to be the best comb foundation that has ever been made.

Why It's Best

Airco Foundation is superior in these points: It is all made of high-grade wax, refined without the use of any acids or other injurious chemicals. By this new refining process, the wax retains its aroma, and the impurities are more perfectly eliminated than by any other process known. Most important of all, the new process of milling this superior wax gives a comb foundation nearer like nature's than any other made. The cell base is thinner and the walls deeper, for which reason the bees accept it sooner and draw it out more quickly than they do the old-process foundation.

We invite every beekeeper in America to make his own test of Airco Foundation this year. We shall be willing to abide entirely by the verdict to be rendered by users of this far superior new foundation.

Write for particulars and prices.

The A. I. Root Company

Medina, Ohio

A Happy "Beeware" Year

A Happy New Year to all beekeepers is our wish. You can make it happier—make it a ''Beeware'' year. Look over the list of improved appliances we offer. Each embodies the quality found only in our goods. Thousands look for this mark—''Beeware.'' Do you?

Three New Branch Houses

Eastern and Southern beekeepers will be pleased to know that their increasing patronage has necessitated the opening of three new ''Beeware'' branches to afford them the service to which they are entitled. Address the G. B. Lewis Company at:

328 Broadway, Albany, New York.
Lawyers, (Near Lynchburg), Virginia.
132 Webster Ave., Memphis, Tennessee.

Some "Beeware" Surprises

A Lewis 4-way bee escape, **faster and better;** a new Lewis wiring device, **takes any size frame;** Woodman's Big Smoke Smoker, **for the commercial honey producer;** Muth's improved bee-veil, **your shoulders won't push it off;** Lewis capping melter, **no overheated honey from cappings;** 5-way wood-and-zinc excluder, **wire brushed;** honey tanks, heavier and **electric welded;** metal eyelet end-bars, **no sagged brood combs;** many other **improvements found only in Lewis ''Beeware.''**

LOOK FOR

BEE HIVES AND APIARIAN EQUIPMENT
BEWARE
WHERE YOU BUY YOUR
BEEWARE
WATERTOWN WIS. U S A
MAKES THE FINEST.
COPYRIGHT, 1916, BY G. B. LEWIS COMPANY

THIS MARK

Only distributers of Lewis ''Beeware'' sell these. Your ''Beeware'' catalog gives your distributers' name. Let us send this surprise catalog; write us today.

G. B. Lewis Company - Watertown, Wis.

Makers of Lewis ''Beeware''—Nationally Distributed.

Gleanings
in
Bee Culture

Warm Enough — Inside the Hives.

VOL. XLIX — February, 1921 — NUMBER 2

Better get your list of requirements for next year ready and send it in at once. Prices will be quoted by return mail.

Remember the early orders are shipped without delay. New Catalog ready for mailing about January first, 1921.

MILLER BOX MFG. CO.
201 NORTH AVENUE 18
LOS ANGELES, - - CAL.

A SUPPLY BASE

for everything needed in the beeyard, That is what our big establishment at San Antonio really is. We have the goods on hand to deliver, and that is why we are able actually to give prompt service.

We invite and urge you to visit us. The following list is a partial indication of our capacity to serve you with

BEEKEEPERS' SUPPLIES

Airco foundation
Books on bees
Bees and queens
Cages for bees and queens
Division-boards
Drone and queen traps
Extractors
Frames, Hoffman and metal spaced
Gloves
Hives
Honey-boards
Honey-extractors
Jumbo hives
Observation hives
Pails and cans
Smokers
Section holder
Uncapping knives
Wire for frames

The A. I. Root Co. of Texas
Cor. Nolan & Cherry Sts.
SAN ANTONIO, TEXAS.

Boyer's "Quality-First" Tin Honey and Syrup Containers

are the best and cheapest in the long run. Prompt shipments of all standard sizes and styles. Can manufacturers since 1892. Large capacity. If you cannot secure them from your usual supply house, write us your needs.

W. W. Boyer & Co., Inc.
2327-2359 Boston Street - - - - Baltimore, Md.

SEASONAL SUGGESTIONS

Order your supplies early. Don't wait until your bees swarm before you get your supplies. See us NOW. Get our hives, frames, and wonderful Airco Foundation---BEST MADE---at once. Always use Root Quality supplies. It will pay you well. Spring is almost here, so hurry in your order.

The A. I. Root Company of California
SAN FRANCISCO, 52-54 Main St. LOS ANGELES, 1824 E. 15th St.

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THE A. I. ROOT COMPANY, Publishers, Medina, Ohio

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Editor Home Dept.

Iona Fowls
Assistant Editor

H. G. Rowe
M'n'g Editor

WHEN THE BEES STING,

You'll Need an "Ideal Bee Veil"--True to its name.
$1.95 postpaid in U. S. A.

HONEY.

Send us a sample of your extracted honey. We also buy comb honey. Tell us how much you have and what you want for it. We pay the day shipment is received.

WAX--OLD COMB.

We pay you the highest market price for rendered wax, less 5 cts. per pound for rendering charges. Our rendering process saves the last drop of wax for you. "Put your name on all packages."

THE FRED W. MUTH CO.,
"The Busy Beemen"
CINCINNATI, - OHIO.

LEWIS BEE SUPPLIES

Practical Beekeepers stock supplies now. This saves expense and insures against delay in the rush season.

A plentiful supply of 18-oz glass Honey Containers now on hand. Wax and comb taken for cash or trade.

Write Department C.
Western Honey Producers, Sioux City, Iowa.

The enormous demand for

"SUPERIOR" FOUNDATION

signifies highest quality.
Our 1920 output over 150,000 pounds.

Beeswax wanted; For cash, or in exchange for foundation or bee supplies. Prices on request.

Superior Honey Company -:- Ogden, Utah
(MANUFACTURERS OF WEED PROCESS FOUNDATION)

BEE SUPPLIES

Root's Goods at Factory Prices
With Weber's Service

We carry several carloads of bee supplies, and are able to give prompt shipment at all times. Our motto is a customer must be satisfied; give us a trial and we will show you how quickly we will answer your correspondence; send your order and it will follow 24 hours after we receive it. Our new catalog will be ready about January 15th; send for same. We have thousands of satisfied customers; why not you? Send a list of your wants and we will quote you.

C. H. W. Weber & Co.

2163-65-67 Central Ave., Cincinnati, Ohio.

Queens and Bees When You Want Them

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THE A. I. ROOT COMPANY OF TEXAS

P. O. BOX 765, SAN ANTONIO, TEXAS.

SEND TO INDIANAPOLIS FOR YOUR BEEKEEPER'S SUPPLIES

Our stock is new and complete and we are prepared to give the best of service. Send for 1921 catalog. They will be out soon after the first of the year. Gleanings subscriptions also taken.

THE A. I. ROOT COMPANY, 873 MASS. AVE., INDIANAPOLIS, IND.

HONEY MARKETS

There is not much new to report, except that there is hope that the bottom has been reached, and that a slight upward trend has been started in harmony with the general improved economic conditions the country over. Producers are urged to sell their crops locally; and to that end it may be advisable to use liberal advertising space in local papers. Generally speaking, it is not a good time now to send honey in large lots to the big markets, if one can hold it till conditions are better.

U. S. Government Market Reports.

SHIPPING POINT INFORMATION, JAN. 15.

LOS ANGELES, CALIF.—Wire inquiry light, demand slightly better, movement slow, market unsettled, prices lower. Very few sales are being made, and an uncertain feeling is prevalent as to whether still further declines may be experienced. Carloads f. o. b. usual terms, per lb., white orange blossom 16-17c, white sage 14-16c, light amber sage 11-13c, light amber alfalfa 9-10c. Beeswax in less than car lots, 35-37c.

INTERMOUNTAIN REGION (COLORADO AND IDAHO).—According to reports from reliable sources, very light shipments are being made, of either extracted or comb. Supplies of comb are now very light, and practically no large sales of either type of honey or of beeswax are being made. Carlot buyers are reported to have largely temporarily withdrawn from the market, due to the present financial stringency, their lack of confidence in the current market situation, and their desire to enter the new year with small stocks on hand. F. o. b. usual term nominal quotations range 16c per lb. in carlots for extracted, $7.25 for fancy comb, $7.00 for No. 1, and $6.00 for No. 2 comb. It is said that some repacking of extracted stock into 5 and 10 lb. pails is being done for sale direct to the consumer or retail grocer at around 17½-20c per lb. Judging from the present attitude of beekeepers, the relative proportion of comb over extracted will probably increase this coming year. Beeswax, cash to beekeepers, is selling for mostly 36c per lb. for light to medium grade.

BOSTON.—One car Porto Rico via New York City arrived since last report. Comb-honey movement slow, but is steady because of light supply, which is all in hands of dealers. California honey selling very slowly in small lots at slightly lower prices. Good demand and movement for Porto Rico honey because of relatively low prices. (Honey in glass containers is selling about 20 per cent lower than two weeks ago.) Comb: Sales to retailers, New Yorks, 24-section cases white clover No. 1, heavy $8.50-9.00, light $7.00-8.00. Extracted: Sales to confectioners and bottlers, Porto Rico amber, per gallon 80-90c; California, in small lots per lb., white sage 18-20c, mostly 18c. Beeswax: No demand or movement. Nominal quotations to floor-wax and candle manufacturers, per lb., domestic light 35c.

PHILADELPHIA.—Very light receipts of near-by honey, supplies generally moderate, no demand and impossible to establish a market. Dealers are loaded with high-price honey and those with relatively light supplies not buying on account condition of market. Beeswax: Heavy supplies of foreign wax in this district meeting absolutely no demand because industries using this stock are mostly closed down entirely or working short time.

ST. LOUIS.—No carlot receipts reported. Comb: Supplies are liberal with practically no demand. The market is very dull, with almost too few sales to establish a market. Sales to retailers in small lots, Colorado, white clover and alfalfa No. 1 heavy, in 24-section cases $7.50-8.00 per case. Extracted: Supplies are also liberal with practically no demand or sales. Nominal quotations to wholesale grocers, large bakers and jobbers, per lb. in 5-gallon cans, Missouri, Arkansas, and Mississippi light amber various mixed flavors 12-13c, dark amber various mixed flavors 10-11c. California light amber alfalfa around 15c. Colorado white alfalfa and sweet clover mixed 15-16c. Beeswax: Supplies are light, no activity at present in beeswax market, but market is nominally weaker and prices lower. Nominal quotations to jobbers, and manufacturers of floor wax and comb foundation, Missouri, Arkansas, and Mississippi, light per pound 26c.

NEW YORK.—Extracted: Liberal l. c. l. receipts from N. Y. arrived. Supplies moderate, demand and movement light, market very dull. A few bottlers, bakers, and confectioners are buying, principally South American and West Indian honey, largely in place of sugar. Sales to jobbers, large wholesalers, confectioners, bakers, and bottlers, domestic, per lb., Californias, light amber alfalfa 11-12c, white alfalfa 12-14c, few 15c, light amber sage 15-16c, white orange blossom and white sage 16-18c, mostly 17-18c. Imported, West Indian and South American refined per gallon, best, 70-75c, few 80c, poorer low as 60c. Comb: Practically no supplies, no sales reported. Beeswax: L. c. l. receipts from New York liberal. Supplies moderate, demand and movement light, market dull, very few sales reported, buying being done almost entirely in small lots. Sales to jobbers and wholesalers, South American, West Indian, and European, light 20-22c, few high as 24c; dark 18-20c per lb.

CHICAGO.—Since last report, 1 car California extracted consisting mainly of sage and alfalfa arrived. Movement very slow, the main reason for which seems to be cheapness of sugar, weak market, and prices slipping gradually to lower levels. Local storage holdings appear liberal and buyers generally inclined to hold off from buying in producing sections. Sales to bottlers, wholesale grocers, mail-order houses, and some direct to retailers—stock mainly alfalfa and clover and coming from Wisconsin, Iowa, Colorado, and Minnesota. Extracted, per lb., white 14½-15½c, light amber 14-14½. Comb: Best No. 1, $6.75-7.00 per 24-section case, light sections and poor-color comb bringing $5.50-6.50. Beeswax: l. c. l. receipts moderate, but quite a lot of foreign wax arriving from Africa and South America. African wax is inferior, but South American is comparable to domestic and brings about same price. Sales mainly to wholesale drug companies and harness manufacturers; Colorado, Ohio, rado, Ohio, Wisconsin, and South America light 31-32c, dark 30c per lb.; African, mostly dark 27c per lb.

CINCINNATI.—Receipts light, with no carlot arrivals reported. Comb: Supplies light, demand moderate, market steady, prices holding firm. Sales to retailers, Ohio white clover, 24-section cases No. 1, $8.50 per case. Extracted: Supplies liberal, practically no demand or movement, too few sales to establish market, and dealers trying to unload present stocks before buying more. Nominal quotations by receivers, Ohio, white clover 13-15c per lb. Beeswax: Supplies moderate, demand fair, market holds firm with prices practically unchanged. Sales to wholesale druggists and harness manufacturers, average yellow 39-45c per lb.

GEORGE LIVINGSTON,
Chief of Bureau of Markets.

Opinions of Producers.

Early in January we sent to actual honey-producers in California, Colorado, Idaho, and Washington the following questions:

1. What percentage of the honey in your section is still held by the producers?
2. (a) Thru what channels has the honey been disposed of, that is out of the hands of producers? (b) and at what prices for both extracted and comb?
3. What is the condition of the bees as compared with normal? (Give your answer in per cent figures, counting normal as 100 per cent.)
4. What is the condition of the honey plants?

CALIFORNIA.—Perhaps 10 per cent of honey crop in southern California is still held by producers. A large per cent was disposed of thru the Exchange, remainder thru brokers and retail stores. The Exchange still has some sage and alfalfa honey, but the orange is all sold. Condition of the bees 90 per cent. Lack of moisture in the form of early rains makes honey plants backward.—L. L. Andrews.

CALIFORNIA.—Only a small amount of honey is still held by producer. Condition of bees 100 per cent; condition of honey plants poor for lack of rain. Bees working on willow broom, and in some places on the gum or eucalyptus. I am told that the State Exchange is selling extracted honey at 17-20c; the amount of comb honey produced in southern California is so small as to be hardly worth mentioning. Some alfalfa comb (about No. 2 grade) was shipped here from the northern part of the State and is selling at 35-40c. Many of the producers are retailing at 18 to 25 and 30c. The great variation in prices for same quality of honey is detrimental to the producer. There should be a uniform price.—M. H. Mendleson.

COLORADO.—Seventy-five per cent of extracted honey and fifteen per cent of comb still held by producers. Honey has been disposed of mostly thru jobbers, extracted at 12½ to 18c, comb at about $6.50 per case. Condition of bees and honey plants 100 per cent.—J. A. Green.

IDAHO.—No comb honey is held by the producers, but about 75 per cent of extracted. Honey has been disposed of to firms selling direct to consumer, extracted 15-18c, comb $7. Condition of bees and of honey plants probably 100 per cent.—E. F. Atwater.

WASHINGTON.—About one-third of honey crop still held by the producers. The larger part of that sold, I think has gone direct to consumer at 18-20c for extracted honey. Judging from the mild winter and early moisture in fall I feel that the bees will come out better than usual, and the prospects are good for the 1921 yield of honey. Condition of the bees 100 per cent, judging from my own. Alfalfa and sweet clover are our sources for a honey flow, and judging from the mild winter and the moisture in the ground there is every indication of a big harvest.—Geo. W. B. Saxton.

The questions sent to producers in other States are as follows:

1. What is the condition of the bees in your part of the State as compared with normal? (Please give your answer in percentage figures, counting normal as 100 per cent.)
2. What is the condition of the honey plants in your section?
3. What portion of the honey crop, if any, is still in the hands of producers, and is honey moving?

BRITISH COLUMBIA.—The weather has been exceptionally mild up to the end of the year, and bees are wintering well, having had some good flights. As there are only about two more months of winter, the losses should not exceed 10 per cent. There was very little honeydew or fruit juice stored last year, which is the main cause of our troubles in wintering. White clover is in good condition, having suffered no injury from frost. Practically all of last season's honey crop has been sold.—W. J. Sheppard.

FLORIDA.—The condition of the bees, and also of the honey plants, is about normal. We never have much honey left at this time of the year.—Ward Lamkin.

FLORIDA.—The condition of the bees is 25 per cent above normal. The honey plants are in fine condition now, but it is too early to decide. None of the honey crop is in hands of producers. Honey is not moving except in a few best tourist towns.—C. H. Clute.

ILLINOIS.—Condition of bees normal. Clover in this section was badly killed by the drouth during July and August. What didn't die, didn't make much growth in the fall, so the prospects are very poor. Honey is practically all out of producers' hands. Movement is draggy. There is not much to move.—A. L. Kildow.

INDIANA.—Condition of bees 100 per cent. Condition of clover apparently good. Probably 50 per cent of honey crop in hands of producers; movement picking up.—E. S. Miller.

IOWA.—Condition of bees and of honey plants 100 per cent. Twenty per cent of honey crop still in hands of producers. Honey is moving in a small way as needed. Prices of honey hold up surprisingly, but no buying is done more than for moderate demand. Ground is bare, and clover may be badly killed if covering does not come soon.—Frank Coverdale.

KANSAS.—Condition of bees 90 per cent, of honey plants 100 per cent. Honey crop is all out of the hands of producers. Honey is selling rather slowly. The price of extracted has dropped some; comb is practically all sold.—J. A. Nininger.

MARYLAND.—Condition of bees 110 per cent, of honey plants 100 per cent. About 25 per cent of honey crop still in producers' hands; honey is moving very slowly.—S. G. Crocker, Jr.

MASSACHUSETTS.—Condition of bees and of honey plants 100 per cent. About 20 per cent of honey crop still in hands of producers; honey is moving very slowly.—O. M. Smith.

MICHIGAN.—Condition of bees 100 per cent or better; honey plants never better. Honey is moving locally, but very little is going to jobbing markets.—B. F. Kindig.

MISSOURI.—Bees were never in better condition. Honey plants also in good condition. None of the honey, so far as I know, is still in hands of producers.—J. W. Romberger.

NEBRASKA.—Condition of bees 100 per cent; up to the present, condition of honey plants is good. About one-third of honey crop in hands of producers, and is moving slowly owing to fall in sugar.—F. J. Harris.

NEW YORK.—Condition of honey plants 100 per cent. About 25 per cent of honey crop in producers' hands, moving very slowly.—Geo. H. Rea.

NEW YORK.—Condition of bees fully 100 per cent; easy winter, plenty of flights. Honey plants in good condition as yet; little snow, but no heaving of clovers. Less than 5 per cent of honey crop in this county in producers' hands. Plenty in buckwheat regions. Honey is moving very slowly except at very low prices. Retail demand poor. The high prices on honey and low prices on sugar are showing bad results for honey.—F. W. Lesser.

NEW YORK.—Condition of bees 100 per cent, of honey plants between 75 and 100 per cent. No white honey still held by producers, but considerable dark fall honey. Demand for white honey is good, very slow for dark.—Adams & Myers.

OHIO.—Condition of bees and of honey plants 100 per cent. Not much honey left.—Fred Leininger.

OKLAHOMA.—Condition of bees 95 per cent. About 20 per cent of honey crop is still in producers' hands, and moving very slowly.—Chas. F. Stiles.

ONTARIO.—Condition of bees 100 per cent. In Ontario very little extreme weather to date, and honey plants in good condition. Possibly 15-20 per cent of crop in producers' hands, but just now honey is moving slowly and at somewhat lower prices than earlier in the season.—F. Eric Millen.

PENNSYLVANIA.—Condition of bees 90 per cent. No snow in this section, and clover will freeze out more or less. Less than 10 per cent of honey crop is in producers' hands, moving very slowly. —Harry Beaver.

TEXAS.—Condition of bees 80 per cent. Condition of honey plants very good. No honey in the country.—J. N. Mayes.

TEXAS.—Condition of bees and of honey plants 90 per cent. Ten per cent of honey crop is in hands of producers; honey is moving.—H. B. Parks.

EAST TEXAS.—Condition of bees 90 per cent, of honey plants 80 per cent. Fifteen per cent of honey crop in hands of producers, moving slowly.—T. A. Bowden.

Too Late for Classification.

FOR SALE—One Root-Hatch wax press, single screw, good condition, $12.50; one 60-gal. galvanized honey storage tank, $14.00; new, white pine, standard dovetailed ten-frame hive bodies, with metal rabbets, nailed but not painted, in lots of ten or more, $1.25 each.
J. B. Hollopeter, Queen-breeder, Rockton, Pa.

ITALIAN QUEENS OF WINDMERE are superior threebanded stock. Untested, $1.50 each; 6 for $8.00; tested, $2.50 each; select tested, $3.00. Bees by the pound. Write for prices.
Prof. W. A. Matheny, Ohio University, Athens, O.

Pure Italian queens and nuclei. 1 untested queen, $1.50; 12, $15.00; tested, $2.50 each; 2-frame nucleus, $5.00; 3-frame nucleus, $6.50; queens extra.
Frank Bornhoffer, Mt. Washington, R. D. No. 17, O.

FOR SALE—Extracted clover basswood honey, finest quality, put up in 10-lb. pails.
S. E. Angell, Clear Lake, Wisc.

MAKE THIS YEAR A COMB HONEY YEAR

Normal conditions are returning, and with them Comb Honey is receiving better proportionate returns than extracted. There is and will be an under-production of comb honey.

TWO SUGGESTIONS

1st. Use comb-honey equipment you now have.
2nd. Get more equipment, and make it ''Root quality.''

We would like to talk with you about the matter.

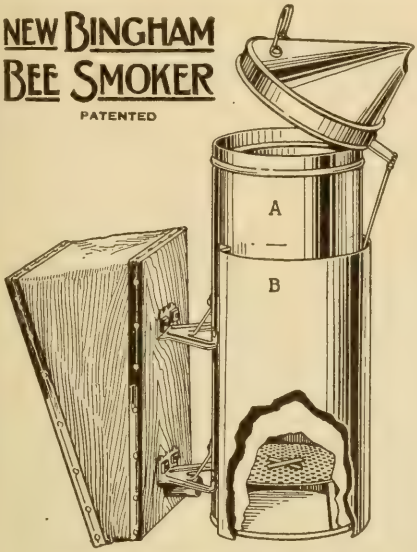
Write us regarding it, and also ask for our 1921 catalog.

WE ARE ALWAYS
AT YOUR SERVICE

M. H. HUNT & SON
510 North Cedar Street
LANSING - MICHIGAN

NEW BINGHAM BEE SMOKER

PATENTED



The Bingham Bee Smoker has been on the market over forty years and is the standard in this and many foreign countries. It is the all-important tool of the most extensive honey producers in the World. It is now made in five sizes.

Postage extra	Size of stove inches.	Shipping weight lbs.
Big Smoke, with shield......	4 x10	3
Big Smoke, no shield........	4 x10	3
Smoke Engine	4 x7	2¼
Doctor	3½x7	2
Conqueror	3 x7	1¾
Little Wonder	3 x5½	1½

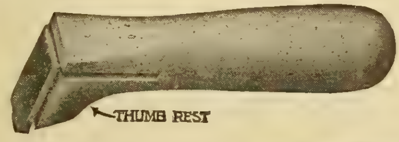
The Big Smoke has just been produced in response to a demand for a larger-size smoker, one that will hold more fuel, require filling less often, from extensive bee handlers.

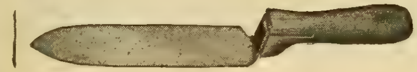
East Lansing, Mich., May 10 ,1920.

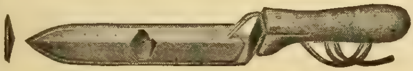
A. G. Woodman Co., Grand Rapids, Mich.

Dear Mr. Woodman:—I have now had several weeks' opportunity to try out the New Smoker called the Big Smoke, with the guard about the fire pot. The smoker is even more than I anticipated and unless something else is brought out that is still better, you can be assured that this particular one will be standard equipment for this place from now on.

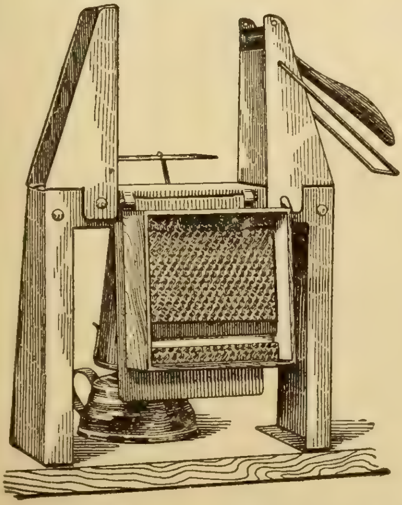
B. F. Kindig,
State Inspector of Apiaries.







The Genuine Bingham Honey Uncapping Knife is manufactured by us here at Grand Rapids and is made of the finest quality steel. These thin-bladed knives, as furnished by Mr. Bingham, gave the best of satisfaction, as the old timers will remember. Our Perfect Grip Cold Handle is one of the improvements.



The Woodman Section Fixer, a combined section press and foundation fastener, of pressed steel construction, forms comb-honey sections and puts in top and bottom foundation starters, all at one handling. It is the finest equipment for this work on the market.

TIN HONEY PACKAGES

2 lb. Friction top cans, cases of 24.
2 lb. Friction top cans, crates of 612.
2½ lb. Friction top cans, cases of 24.
2½ lb. Friction top cans, crates of 450.
5 lb. Friction top pails, cases of 12.
5 lb. Friction top pails, crates of 100.
5 lb. Friction top pails, crates of 200.
10 lb. Friction top pails, cases of 6.
10 lb. Friction top pails, crates of 100.

Special prices on shipments direct from Chicago now.

100 5-lb. friction top pails......	$ 8.50
100 10-lb. friction top pails......	12.50

Ask for our special money-saving prices, stating quantity wanted.

Send us an itemized list of your requirements and let us figure on your goods for 1921. Our new catalog will be issued about Jan. 1.

A. G. Woodman Co., Grand Rapids, Mich., U. S. A.

Nationally Known Beekeepers
———Come to Buy———
Nationally Known "Beeware"

Standing Before The "Beeware" Office These Men Represent

A. G. Woodman Company, F. W. Muth Company, B. F. Smith, Jr., Montana Honey Producers, Otto Schwill & Co., Dadant & Sons, Western Honey Producers, Colorado Honey Producers, Texas Honey Producers, Louis Hanssen's Sons, Charles H. Lilly Company, Howard W. Brandt, G. B. Lewis Co., Memphis, Albany, Lawyers.

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G. B. Lewis Company, Watertown, Wisconsin
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EDITORIAL

The A. H. P. L. Meeting.

THE ANNUAL meeting of the American Honey Producers' League will be held at Indianapolis, Ind., in the Claypool Hotel, on Feb. 15, 16, and 17. The program for this meeting is given among Just News on page 104 in this issue. We strongly urge all beekeepers who can possibly do so to attend this important meeting.

* * *

Gleanings Subscription Price to Remain $1.00.

THE PUBLISHERS of this journal for several months have had to consider the possible necessity for raising its subscription price. The cost of publishing is so abnormally high as to render it very difficult to "make ends meet"—to say nothing of any profit whatever. But with a present slightly downward turn in the prices of some printers' material, we are going to hope for further reductions in our printing costs, and in the meantime hold to the dollar subscription price. Future printing costs will determine our future subscription price. The definite announcement in some quarters that Gleanings' subscription price would be advanced to $1.50 on Feb. 1 was premature.

* * *

The Dr. Miller Memorial.

PLANS ARE shaping definitely to provide a lasting beekeepers' memorial for the late Dr. C. C. Miller, in which every American beekeeper can have a share. The memorial committee to have the entire matter in charge, as appointed by the chairman, C. P. Dadant, consists of Dr. E. F. Phillips of Washington, D. C., L. C. LeStourgeon of Texas, B. F. Kindig of Michigan, and E. R. Root of Ohio. It is already decided to raise the memorial fund by popular subscription—none over a dollar, and a dime as welcome as a dollar. It is the number of beekeeper friends of Dr. Miller contributing to this memorial rather than the size of contributions, that the committee first of all seeks. Dr. Miller would prefer this if he were living, and a memorial so raised means most and is most fitting the man. Dr. Miller's birthday, June 10, will be made his memorial day, when every American beekeeper will be invited to contribute his dime or quarter or dollar to the memorial fund, sending it on that day to designated receivers of subscriptions. More definite details for the observance of this memorial day and plans for raising the memorial funds will be announced later.

General Conditions and Prospects.

REPORTS FROM beekeepers thruout the country indicate that the colonies were in splendid condition at the beginning of winter, both as to the quantity of stores and young bees. The early part of the winter has been unusually favorable for good wintering.

In the eastern part of the country the condition of the honey plants is quite satisfactory. White and alsike clover are reported to be in good condition except in a few small spots where there was prolonged drouth during the summer.

Recent rains in California have brought the rainfall of this season up to the total of last year in the southern part of the State, while northern California has already had from two to three times that of last year. These rainfalls promise well for California's 1921 honey crop.

* * *

Wintering Bees in the South.

BEEKEEPERS who live in the North are usually surprised to learn that there is such a thing as a wintering problem in the South. In some cases it is more difficult to have colonies come thru the winter strong and in good condition for an early honey flow in the South than it is in the North. While the bees in the South do not have to contend with extremely low temperatures nor with the terrible wastage of their vitality brought about by restlessness from accumulated feces, caused by poor stores and long periods of confinement to their hives, they may suffer even greater destruction of their vitality from useless activity in the hives and fruitless flights over barren fields when it would be infinitely better if they would remain quiet within their hives saving their vitality until it could be used advantageously. Under these conditions colonies that were strong in the fall may be reduced in the spring to mere nuclei, which build up so slowly that they are not able to take advantage of an early honey flow when it comes. Excessive winter activity also means an excessive consumption of stores during the winter period, and colonies that would be considered to be well provisioned for the long northern winter would in many cases run short of stores in the shorter southern winter. The more rapid destruction of the vitality of the bees in the South means, of course, that the period of rest from brood-rearing must be much shorter than further north, and in some cases this rest is reduced to but a few weeks.

In some cases winter protection as used in the North may be a great advantage in reducing winter activity by preventing the hive from warming up too much during the day; but, as one beekeeper put it, the first thing to do is to "wrap them up in lots of honey.'' Beekeepers in the South, as well as in the North, who have tried leaving more honey in the hives than they think necessary are reaping rich rewards for doing so.

Cellar Temperatures Again.

THE EXACT temperature best for the bee cellar depends upon so many things that to attempt to establish a standard temperature for all cellars under all conditions would be absurd. It should be high enough so that the bees will not need to generate much heat to keep the cluster warm, yet low enough to cause the bees to form a cluster and remain quiet within the hives. The important thing in keeping the bees most nearly quiet is the temperature of the air within the hive. If heat escapes from some hives more rapidly than from others a higher cellar temperature becomes necessary to maintain the best temperature of the air surrounding the cluster. The style of the hive, the size of the entrance, the size of the cluster, and the character of the stores may make considerable difference in the relation of the temperature of the air within the hive and that outside the hive. If the cellar temperature runs too low, and can not be raised by closing the ventilators or by packing exposed doors and windows, the entrances to the hives can be reduced, which should raise the temperature within. Strong colonies may be given large entrances and weak colonies small entrances, so that both may have the same temperature within the hives. The best temperature for the cellar is that which results in the greatest degree of quiescence on the part of the bees whether it be 40 degrees or 50 degrees.

Heat Generation in Late Winter.

IN THE fall and early winter when the bees are not active the generation of heat within the cluster is only that required to maintain a temperature not lower than 57 degrees F. in the outer margin. As the temperature outside rises and approaches 57 degrees F., the generation of heat within the cluster is decreased accordingly; and, as the outside temperature goes lower, the generation of heat must, of course, be increased sufficiently to keep the margin of the cluster at about 57 degrees F. When the temperature outside rises to 65 degrees F. or more the cluster is broken and the bees become more active.

As the winter advances the extreme repose of November and December is not maintained, especially if the winter stores are not of the best; and the bees begin to generate heat, not for the purpose of maintaining a delicately balanced temperature within the cluster, but because of restlessness. If the stores are poor and the bees are denied a cleansing flight, the heat generated from this cause may be many times that needed for the maintenance of the proper cluster temperature, and the earlier responses to changing outside temperatures may be completely discontinued, a much higher cluster temperature being now maintained. When this happens, of course more stores are used, and the vitality of the bees is wasted rapidly.

Even with good winter stores, a higher cluster temperature is maintained during the latter part of winter, and if the bees are in the cellar they become more and more susceptible to a higher cellar temperature. To compensate for this extra generation of heat within the hives it is sometimes necessary to lower the temperature of the cellar as spring approaches.

Plain Talk on a Troublesome Matter.

AFTER A SEASON'S experience with our guaranteed advertising policy we have to announce several new conditions, both for queen and bee rearers and for their patrons. As a journal we are pioneering in this field of guaranteed advertising, and have to ''live and learn.''

Entrance to our advertising columns by newcomers in the field of queen and bee rearing will be made stricter than before—and some of the advertisers of the past season will not be found in our columns again. These will be excluded, not on the ground of dishonesty, but because of lax business methods, failure to answer correspondence promptly, and proneness to promise too much in advance. We mean to exclude from our columns not only the dishonest and unreliable advertiser but also the careless and negligent advertiser.

All new advertisers will have to furnish us the best of character and financial references before entering our columns as heretofore, also satisfy us that they have colonies enough and of the right kind to make good their advertisements, and any advertiser against whom any justifiable complaint is made by one of our subscribers must expect to be excluded from our columns at least until such complaint or complaints are satisfied.

Now, a word to our subscribers about their relations to our advertisers. Some of them are quite unfair to the advertisers. Some few of them are not above the suspicion of misrepresenting to secure an advantage over the advertiser. Some of them write to us and complain of an advertiser without first complaining to the advertiser himself and giving him a chance to explain or make good—an utterly unfair thing to do. Some write us complaining bitterly of some deal with an advertiser, and then write apologizing for having done the advertiser an injustice. Some write expecting us to serve both as attorney-at-law for them and court of justice, asking immediate decision, altho we may be a thousand miles away and don't know a proven fact in the case.

All in all, we get many hundreds of letters each beekeeping season complaining mostly of a comparatively few queen and bee rearers. Some of these complaints are justifiable, and we are anxious to receive all such in order that we can call erring advertisers to account. But many of these complaints are not justified—and these we don't want to get. We say many of these complaints are not justified because nine-tenths of our advertisers of bees and queens are entirely dependable and business-like in every way; and because many inexperienced beekeepers who order pound packages of bees do not know what to expect and a few dead bees in a package will excite them to a roar of complaint.

The sum total of the effect of the letters of complaint to us is, that the correspondence in which we are involved because of the advertisements of queen and bee rearers in Gleanings makes this advertising totally unprofitable to us financially and a disagreeable feature of our business at all times. We purpose to change this situation by adding the following conditions to our advertising guarantee:

Gleanings in Bee Culture will not be responsible in any way for any deal for bees or queens in which the purchaser advances the cash to the queen or bee rearer without an arrangement, either thru a bank or express company, whereby he (the purchaser) can make examination of the bees or queens upon arrival and before the money is released to the shipper. Such arrangement should provide that as many bees as arrive in good condition be accepted and paid for, and a bad-order receipt sent at once for dead bees or for bees not accepted for some other possible cause.

We repeat that the very great majority of our advertisers of bees and queens are financially responsible, prompt in business methods, and will make good in every way for money sent in advance of delivery. We never have a complaint against many of these. But some new advertisers, we find, despite bank references and references of local officials and local business men in their communities, and even despite their own good intentions, do not keep their promises to us always nor to our subscribers who patronize them. This is generally because of inexperience in the business; or because of promising an exact date of shipment without a reservation as to weather and season conditions permitting; or because of a lack of sufficient capital to warrant their engaging at all in the queen and bee rearing business; or because of lack of any provision for prompt correspondence at all times—whether during a busy or slack season in the beeyards.

So it is that we shall not hold ourselves responsible for money paid in advance to queen or bee rearers, in deals which we do not make, and which we find are often made without taking the commonest business precaution. We want our subscribers to take the same business care we ourselves would take in making a deal for queens or bees—trust our "cash in advance" only to those who we know by experience have an established record of honest business dealing. Not knowing the dealer or his business reputation, we should demand the right of examination before making payment. This is not a hardship even to the new dealer in bees and queens if he is the right kind, for if he hasn't capital enough to await payment for his shipments, he hasn't capital enough to warrant his being in the business at all.

But we find no fault with the honest, business-like, prompt queen or bee rearer who demands pay in advance, either the whole or at least a part. He is worthy of such confidence, has proved himself, and can secure orders on these terms. Moreover, he knows there are tricky and dishonest beekeepers who may order queens and bees of him, and if they have not paid in advance will make all sorts of dishonest representations in dickering for a "settlement," and such tricksters have all the advantage if payment in advance has not been made. In case the queen or bee rearer does not require payment in advance, it is for him to inquire and know very certainly that the persons to whom he may send bees or queens, either C. O. D. or on credit, are strictly honest and dependable. It is for him, with the aid of all other queen and bee rearers and of Gleanings in Bee Culture, to make a black-list of dishonest purchasers of queens and bees and mercilessly expose them to everybody.

Another condition: After a long experience with unjustifiable and even questionable complaints against queen and bee rearers, we shall ask that a sworn affidavit of the facts set forth in a complaint against any queen or bee rearer be furnished us when the complaint is made, such affidavit not to be made until after complaint has been made to the bee or queen rearer in the case and he has been given fair opportunity to make good. An affidavit is not difficult to make or have sworn. Anybody with a just complaint against one of our advertisers should be glad to furnish us an affidavit, and we will at once proceed (on the strength of an affidavit) to investigate the advertiser against whom complaint is made. If we find the sworn facts warrant it, we shall then not only throw the advertiser out of our columns, but at our own expense will proceed (by law if necessary) to compel him to make restitution or to secure his proper punishment.

We seek both to be relieved of the burden thrown upon us by the unwise deals of our readers and their unjust complaints, and also to drive the unreliable queen and bee rearer out of business or even to punish him by law if he so deserves.

We hope for the hearty support of our many reliable queen and bee rearers and also every reasonable subscriber, in this policy.

HIVES FOR EXTRACTED HONEY

Increasing the Capacity of the Brood-chamber by Means of Better Combs

By Morley Pettit

When a scientist prominent in beekeeping was asked recently what real advantage a frame deeper than the Langstroth might have, he replied something like this: "Well, you know most Langstroth combs have an inch and a half to two inches of stretched cells below the top-bar which the queen will not use." "Yes," I said, "and they have at least a quarter inch more wood than they need in the top-bar, and a half inch space above the bottom-bar, which itself is thicker than it needs to be."

To the elimination of this waste of space in Langstroth frames instead of enlarging them to accommodate both waste and queen, I have devoted much time, thought, and energy for several years. To begin with the frame: it was thought some years ago that the introduction of more wood in the top-bar reduced the burrcomb nuisance in comb-honey production. I know from years of experience in producing exhibition sections that the bee-space is the vital matter and not the wood; but since we are now discussing extracted-honey production, the issue need not be raised here except to illustrate the fact so ably pointed out by Demuth that most beekeepers are producing extracted honey with comb-honey equipment. To my way of thinking, the deep top-bar has not one redeeming feature. It is a pure waste of material, which is now so expensive. It is worse than waste, for it crowds the queen needlessly in the brood-chamber which is already too small, and in a double brood-chamber it increases the barrier to a free passage of the queen up and down. The extra quarter inch, over the five-eighths inch depth which we find sufficient, crowds out at least 170 worker-cells, which means a loss of 1700 possible workers per generation in a 10-frame hive.

Next, by care in having combs built, and by sorting out faulty ones, we eliminate the inch and a half to two inches of stretched cells and most of the space above the bottom-bar. Suppose we gain two inches in depth of breeding comb by this, that would be 1836 cells per comb, on a basis of 27 cells per square-inch surface. But to be conservative, say we admit that our combs may not be so nearly perfect, and that the combs in the average apiary may not be so bad, and cut this estimated gain in half. We would still have by careful methods an advantage of 918 cells per comb, and by a better frame an additional 170 cells, being a total of 1088 cells in each brood-comb. This means that by attention to good combs we increase our possible production of population in each hive by something over 10,000 worker bees, that is, two pounds, or a small swarm every three weks at a critical time. Isn't it worth it?

Another point in the economy of the brood-chamber is the matter of stores. Our slogan here is, "**The brood-chamber for brood.**" There is not one month in the twelve when we want honey in the brood-chamber! We want 10 good all-worker combs, with some pollen stores and a minimum of drone-cells next the bottom, but otherwise clear for the queen to fill right to the top-bar. As described in September "Gleanings," the honey stores are kept in the food-chamber which is never removed from the hive. This is a standard shallow super, Townsend's "food-chamber," Demuth's "automatic feeder," automatic because it fills up in time of plenty and gives down in time of dearth. It supplies honey during the whole breeding season, is raised above supers as they go on, and gives the advantage which advocates of the Heddon hive used to claim for a divisible brood-chamber by removing the honey barrier between brood and supers. So the argument that deeper combs provide more room for stores falls on deaf ears when it comes our way.

Now after improving the combs we have in Langstroth frames, and adopting a food-chamber to relieve them of responsibility in that direction, we still find that we are able to produce queens which cannot fully display their talents in 10 frames. We assist them by manipulations, but that is expensive. Doubtless the advocates of a deeper brood-frame are right. Among them are men of the highest authority. Their arguments have not been convincing to me because they have stressed "room for stores," which I do not want; they continue to use a stick of timber for a top-bar; and in the Jumbo frame they add only about two inches without saying that they save the waste from stretched cells, leaving me to wonder if we have not as much actual brood space as they. We have hesitated to complicate our equipment by adding another size of frame; but that is a secondary matter if expensive manipulation can be saved; so next season 100 Jumbo brood-chambers containing frames with shallow top-bars and combs as nearly perfect as we can get them will be added to our stock and given a fair test. They will have the same food-chambers and receive the same care; but we hope they will need less manipulation.

Mechanical Features of the Hive Used.

As far as possible we use factory standard hive parts. Some modifications are made in the assembling. The stock "reversible" bottom-board is not changed, but is never reversed, being used with the deep side up. The width of hive is 16⅝ inches as made in Ontario. This was intended for 10 frames spaced 1⅜ inches and a follower. By discarding the follower we get 1½-inch spacing which we prefer. Frame spacers are “⅞-inch bed staples,” driven one in each side of the top-bar not more than one inch from the ends. They are in the same position at each end of every frame, so no matter which way the frame is turned they always function. They are close to the ends to reduce interference with uncapping knives. Being placed with edges up and down they slip into place without catching on the next top-bar. I was brought up on “finger spacers”—know all about them—and would not revert to such a time-wasting system on any account. I have tried over a thousand Hoffman-spaced frames and still have some wooden ears to trim off at each annual round-up. I have studied every other type of spacer on the market, and prefer staples. Their only objections are a slight cutting into the top-bar of the next frame and a slight tendency to weaken the lug. We overcome the latter by reinforcing the lug with a nail driven thru the top-bar and clinched. When used in the extractor they sometimes catch in the basket, and a careless uncapper may try to cut them off. The advantages of staple spacers are the small point of contact, eliminating interference by wax and propolis, and the “elasticity” of the system, by which term I mean that we are not tied to the width of spacing the factory happens to give us, and we can fix up old frames of odd widths.

After nailing, our hive-bodies are carefully “jointed,” that is, they are trimmed on the edges with a long plane to make a tight joint with the next one above and below. Then metal frame rests are nailed accurately by gauge to bring the top-bars just even with the top of the hive. This leaves a full bee-space under the frames. It makes it easy to scrape off the top-bars. But that is not all; whatever goes on next, be it queen-excluder with space turned down, or super, or cloth and cover, or moving screen with deep rim, whatever it be, it grips the frames firmly at the ends so they cannot swing; and with spacers to prevent side-shifting they need no other fastening for any kind of migrating. In wintering this arrangement provides extra space below the frames for possible accumulation of dead bees.

Our hives were first planned with migrating in view. That is why we object to projecting cleats or handles—they interfere with close loading on a truck. We have to be content with hand holes only, but we have them on all four sides. It is why we object also to a projecting cover. The one we use has a rim of folded galvanized iron only, taking practically no side space. It has the same iron over all, and inside is a wooden tray with ⅞-inch felt or cork packing. The lower side is flat to rest evenly on the frames, but has a piece of tough smooth cloth between to prevent waxing. I never could stand having to crack loose a cover, even when waxed only around the rim. It stirs up a spirit of opposition quite out of proportion to the needs of the case.

These are the main features of the hive we use. Super and brood-chamber combs are interchangeable. That is very convenient and the main objection we have to introducing a deeper brood-comb. All combs are built on well-wired foundation, and faulty ones are sorted out and marked by a simple mark on the top-bar to be used in supers only. We endeavor to make the best use possible of the brood-chamber space; then if we can produce queens which the present brood-chamber cannot accommodate, it must be enlarged. From the beekeeper's standpoint the hive is made as simple and efficient as we know how.

Georgetown, Ont.

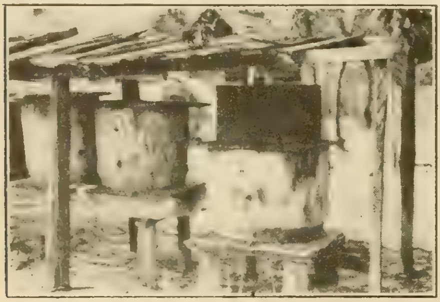
TRANSFERRING IN THE SOUTH

C. L. Sams and His Methods in Demonstration Work Done in North Carolina

By E. R. Root

It would almost seem that the subject of transferring is out of place in a modern bee journal devoted to up-to-date methods for keeping bees. The average northern beekeeper would suppose box hives and log gums to be a thing of the past, and that we had better look forward rather than backward; but a tour thru the southern States, especially North Carolina, South Carolina, and Georgia, would convince him that these types of old-fashioned beekeeping are very much in evidence. In fact, in some parts of the Coastal Plain of the southeastern States the box hive or the log gums are about all one does see in the line of beekeeping. Since the war the high price for both beeswax and honey has induced the northern beekeeper to come south to buy up these old gums, which he has been able to get at from two to three dollars. Some of these box hives full of black bees have made, when transferred, splendid investments. I have known of a few cases where colonies in gums bought for $2.00 when transferred have brought in over 100 pounds pounds of honey which, at war prices, have returned a thousand per cent profit.

Where modern methods have been introduced the natives have been quick to see the advantage of the new system, and no longer will they part with their gums at $2.00 each. No, sir; some of them are talking eight and nine dollars where two was sufficient before. You see they have been ''educated.'' Where that is true you must go further south or further back in the woods, and perhaps you can find bees at $2.00. There are plenty of places in the Southland where black bees can be bought at low figures; but, mind you, after you have bought up one lot, transferred them, and shown what can be done, you can buy no more at the former prices. You will have to find ''pastures new'' where the native beekeeper has not been ''educated.''



Log gums used for producing comb honey, with the "supers" in position.

Unquestionably, the man who has done the most to ''educate'' the log-gum beekeeper of North Carolina is C. L. Sams, operating as a special bee-extension man jointly for the Bureau of Entomology, Washington, D. C., and the Department of Agriculture at Raleigh, N. C. If there is any man who thoroly knows beekeeping in the State it is Sams. He does not buy up bees at so much per, and then show the box-hive man where he lost out; but he goes out over the State giving demonstrations not only on how to transfer but how to keep bees better. He will pick out some beekeeper centrally located, then send notice to all others in the vicinity that, on a certain date at this place, he will give a demonstration in transferring. At this time he will show modern hives and modern implements, such as bee-smokers and bee-veils. With these he will transfer several colonies and then ask the box-hive beekeepers to come back later to see him take off the crop. One intelligent box-hive man ''converted'' to modern methods with a modern equipment serves as a tremendous object lesson to the whole neighborhood. Mr. Sams gives this one man particular attention until he can work alone. Key men like this are being established all over the State, and the effect of this kind of direct instruction, the kind that shows for itself in dollars and cents, can be imagined.

A typical box-hive apiary such as is to be seen all over the Southland.

Log-gum apiary of J. S. Kelly near Wilmington, N. C. Mr. Sams holding an empty gum, and altho the bees were stinging him unmercifully, he stood his ground while the Editor was "snapping" him.

In some cases Mr. Sams advertises that he will give some live-bee stunts on a certain day in some city or town. These stunts are usually given in some park or on the grounds of the courthouse. All persons especially interested in bees and all fruit-growers desirous of more and better fruit are especially invited. On the day appointed he will transfer a colony or two from log gums to modern hives. While doing this

Mr. Sams tipping up the hives in a box-hive apiary, one after another, and looking "up under" to learn their condition. This is all the "inspecting" with box hives.

he scoops up bees with his bare hands, puts them in his hat, and then wears the hat. With bees in his hands and in his ''bonnet'' he will reel off before the astonished crowd an interesting story about bees and how one of his key men, Mr. Jones, we will say, is keeping bees on the new plan over at cross-roads so and so. To the fruit men he explains the value of bees as pollinators. This kind of talks and demonstrations is certainly making a hit all over the State of South Carolina. It would be difficult to estimate the value in dollars and cents. If Mr. Sams keeps up this pace, South Carolina as a bee State will come forward by leaps and bounds. His is the kind of work that counts, because the eye can see the methods and the results. The proof of the pudding is in the eating.

Mr. Sams drumming on the hive to drive the bees up against the top board so he can remove them and then cut out the combs. Courthouse officials of Wilmington, with an inborn sense of safety and a snap, looking out from withi.

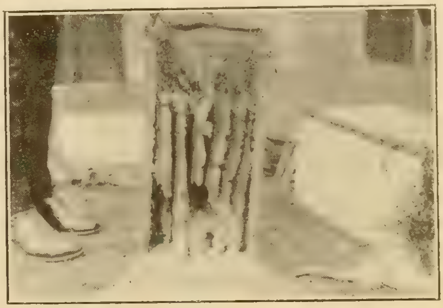
Mr. Sams, bee extension agent for Uncle Sam and North Carolina, cutting the combs of a box hive loose with a hand saw, on the courthouse grounds at Wilmington, with a crowd watching. (Courthouse officials still inside.)

I think I am in position to know something of Mr. Sams' work, because it was my privilege to follow him last spring over the State. I took snapshots of him in action, some of which are given herewith.

In our next issue I propose to show his methods, particularly those illustrating his plans for transferring. If there is any man in this whole country who knows this art, it is Mr. Sams.

Nature's Spacing of Combs.

The illustration at the top of this column shows how irregularly bees space their combs when they work as they used to do thousands of years before man tried to regulate the distances. In view of recent discussions on the proper spacing of combs for brood-nests I was interested to measure up the distances between the combs. I made hundreds of measurements while looking over box hives in the South, and I find that the **average** spacing for worker brood seems to be slightly under 1⅜ inches. The store combs run all the way from 1½ and 1¾ to 2 inches, or an average of slightly over 1½ inches. In a large number of cases it was noticeable that the combs were spaced wider apart at the top of the box or gum, and closer together toward the centers and the bottom. The illustration shows a slight tendency that way; but it is not so pronounced as a number of others that I saw. For brood-rearing it is apparent to me that nature indicates 1⅜ inches; for drone comb and store comb, 1½, altho there are wide variations, but the average runs as indicated. Some 30 years ago I had the honor of setting the spacing for Hoffman frames at 1⅜. In view of what I saw in the Southland, perhaps, I was not far out of the way.



The "inards" of a box hive after the bees have been drummed out. Notice how irregularly the bees have spaced the combs.

Modern hives into which bees in "gums" had been transferred by Mr. Sams and his helpers.

COMB HONEY PRODUCTION

The Brood Chamber for Brood. How the Industry was Nearly Wrecked by Small Brood Chambers

By Geo. S. Demuth

ONE of the important requirements in comb honey production is that the brood-chamber be well filled with brood at the beginning of the honey flow, thus making it necessary that the bees begin work in the supers at once to provide a place for the incoming nectar. While the same condition is desirable in extracted-honey production, it is not so essential as in comb-honey production, since the giving of a super of empty extracting combs constitutes a strong invitation to the bees to "come up stairs" and expand their work into the supers even tho there may still be some empty comb below. On the other hand, to a certain extent, the bees must be forced into comb-honey supers by a lack of room in the brood-chamber for the incoming nectar. Too often in comb-honey production the honey flow begins before the brood-chamber is filled with brood, and if storing is begun in the brood-chamber and honey is sealed down close to the brood, the bees usually enter the supers reluctantly, being apparently satisfied with the snug and thrifty condition of having sealed honey above and around the brood area as if prepared for winter. Under such conditions the bees sometimes act as if they had finished the season's work, even tho the honey flow is just beginning, and often waste much valuable time loafing even during a good honey flow. Such colonies are usually among the first to prepare to swarm.

On the other hand, colonies that have their brood-chambers well filled with brood when the honey flow begins, should enter and begin work in the supers promptly and should expand their work into additional supers, building combs in advance of their needs so that, even tho they may be much stronger than the colonies which began their storing within the brood-chamber, they are much less inclined to swarm. This highly desirable condition of having the brood-chamber well filled with brood and almost free from honey at the beginning of the honey flow is usually present in only a part of the colonies each year and some seasons in but few if any of them, and it has long been well known that these few colonies which do happen to be in this condition are the ones which, if properly managed, give the very best results in comb honey.

It is not surprising, therefore, that the early masters in comb-honey production recognized this problem and attempted its solution. The methods which they used to get the brood-chambers filled with brood and free from honey just at the critical time—the beginning of the honey flow—have had such a far-reaching influence upon the beekeeping industry, and the history of the development of these methods furnishes such a striking and wholesome lesson for present-day beekeepers that it is well worth while to review briefly this development.

Early Attempts to Eliminate Honey from the Brood-Chamber.

In his early experiments Langstroth found that the storage of too much honey in the brood-chamber previous to the beginning of work in the boxes could be greatly reduced by the use of a shallow hive, and in adopting the particular depth of the Langstroth hive he was greatly influenced by this fact. In effect the shallow hive cuts off the honey at the top and permits placing the boxes down close to the brood, which is so important in inducing the bees to begin work in the boxes.

Langstroth built his hive to hold 10 frames and considered this to be the best size for the production of honey in the 6 to 10 pound boxes which were the "supers" of that time.

In using the Langstroth hive to produce honey in sections, beekeepers soon learned that better results could be secured from the weaker colonies by removing any combs not well filled with brood at the beginning of the honey flow and filling the vacant space with wide frames, each holding eight sections, or with thick division-boards, which came to be known as "dummies." Later, the wide frames and side storing were abandoned and dummies became a part of the regular equipment for comb-honey production.

Reduction in the Size of the Brood-Chamber.

Since the majority of colonies usually had some combs not filled with brood, at the beginning of the honey flow many beekeepers reduced the size of the hive, cutting it down to eight frames, in order to make sure that most of the colonies would have their brood-chambers full of brood at the beginning of the honey flow. In this case, if any colonies should become crowded for room before the main honey flow, a comb of emerging brood could be exchanged with an empty comb from some colony with less than eight frames of brood. In other words, these beekeepers reasoned that better results could be secured thru a series of years by using a brood-chamber which averaged a little too small instead of one averaging a little too large.

These problems were discussed freely in the bee journals from 1885 to 1890, at which time the eight-frame hive had practically become the standard hive in this country. It should be remembered that at this time comb honey was being produced by a great majority of beekeepers.

Later, however, it was found that the advantage of the eight-frame hives was being lost, for after a few years they in turn were not well filled with brood at the beginning of the honey flow. Within a few years beekeepers were reporting the same difficulties with the eight-frame hive that they formerly had experienced with the ten-frame hive. Instead of recognizing the cause of the smaller colonies being in the reduced capacity of the brood-chamber, with its attendant danger of a shortage of honey at the most critical periods, many beekeepers sought a remedy in a further reduction in the size of the brood-chamber. The dummies of the days of the 10-frame hive were again brought into use, and the "contraction" of the brood-chamber was advocated by most comb-honey producers,

Further Contraction of the Eight-Frame Hive.

This time the brood-chamber was reduced from eight frames to five frames. This contraction was done by some at the beginning of the honey flow when the comb-honey supers were put on and by others only when hiving swarms; but since most of the strong colonies swarmed and the weak ones had to be contracted to induce them to work in the supers, most of the colonies were contracted to five frames at some time during the season, the contractionist advising that parent colonies be contracted to five frames and supplied with a super in order to utilize them as well as the swarm in honey production.

At this time many of the leaders in beekeeping in this country considered five frames to be sufficient capacity for the brood-chamber except during the period of heaviest brood-rearing just previous to the honey flow from clover when the brood-chamber was temporarily expanded to eight frames. These things were taught in the beekeeping literature at the time; and at a beekeepers' convention held in Chicago in 1893 when the question was asked as to the proper size for the brood-chamber for comb-honey production, it was found that the majority of those present favored a brood-chamber of five or six frames capacity.

Poor Seasons Followed Reduction in Size of Brood-Chamber.

It is not surprising that the beekeeping industry suffered a period of severe depression at about this time, for the small hives and severe contraction of that period, together with the gradual elimination of basswood and fall flowers, made the existence of colonies of bees a precarious one indeed unless much feeding was practiced. The series of so-called poor seasons in the clover regions which followed the contraction fad almost wrecked the industry in this excellent honey-producing region, and looking back now it seems remarkable that beekeeping has even partially recovered from the terrible setback of that time.

In November, 1891, Hutchinson wrote in the editorial columns of the Beekeepers' Review as follows: "In 1888 the average yield in my apiary was 10 pounds per colony. In 1889 it was 20 pounds; in 1890 not one pound; in 1891, five pounds. * * ** The honey stored in my apiary the past four years would not have kept us in food more than one year. I am forced to believe that hundreds of beekeepers could make a similar report." After some remarks about the changes in his location, brought about by better agricultural methods, he continues: "What puzzles me is that we had good crops for ten years then poor crops for four years. It seems as tho the change ought to have been more gradual."

Poor Seasons Caused by Lack of Strong Colonies.

That the management was more at fault than the seasons was well brought out in the same journal the next month by Taylor, who wrote as follows: "In my home apiary the past season, I had one swarm for about every 25 colonies, an average of about five pounds of comb honey to the colony. But there was one colony that cast a swarm and gave a surplus of 75 pounds of comb honey over and above sufficient winter stores for the two colonies. * * * * There was no accession of bees from other colonies nor any robbing. Wherein was the power of this colony? Was it from the fortuitous conjunction of conditions at the most favorable times so as to produce extraordinary exertion at the nick of time? Did it possess a secret knowledge of some rich acre of clover in a sunny nook? Or was it possessed of inbred characteristics which gave it powers to excel? If in the first or last, as seems most likely, we have in them a rich field for exploration. He who finds out how to time the conjunction of conditions and to perpetuate the most desirable characteristics will abolish poor seasons, not simply find a doubtful remedy therefor."

Early the next year the same writer revealed this desirable "conjunction of conditions, which has since played such an important part in "abolishing poor seasons," in the following significant statement: "In the leanest of the late lean years, every colony that cast a swarm as soon as the first opening of the white clover has given me more than an average amount of surplus comb honey, and by that I mean more than an average in good seasons. Now it has come to be a fond dream of mine that all reasonably good colonies having good queens can be brought to the swarming point by that time."

The poor seasons continued for many years in the clover region when comb honey was produced. In 1901 in a personal interview with the writer, James Heddon, who at that time was a leader in American beekeeping, stated that his location had failed during the preceding 15 years, and that he had given up hope that the State of Michigan would ever produce another crop of honey.

Good Seasons Are Returning.

Gradually, however, the tide turned in the direction of better crops, as beekeepers learned to leave more honey in the hives and quit nursing along little colonies in little brood-chambers by furnishing them food on the ''from hand to mouth'' plan. Gradually the colonies of better beekeepers have grown larger and larger until now even the 10-frame Langstroth hive has become too small in many cases to hold all the brood of a good colony at the beginning of the honey flow, and those who are using a smaller hive now usually expect to have two stories better filled with brood at the beginning of the honey flow than was the single story of 25 to 30 years ago. The comb-honey producers of the present who are still using the eight-frame hive do not find it necessary to take out empty combs from the brood-chamber and insert dummies to fill the vacant space. Instead of this they are making increase with the extra frames of brood left over when they reduce this hive from a two-story hive to a single story at the time the comb-honey supers are put on at the beginning of the honey flow.

These changes for the better have come about so gradually that many beekeepers have failed to notice the changes in their management which are largely responsible for them, and some are inclined to believe that the seasons are growing better. Others say that we have developed better queens which can fill 12 to 15 frames with brood instead of 5 to 8 as during the days of extremely small brood-chambers.

But to be convinced that the greater amount of stores which the better beekeepers are now leaving with the bees is largely responsible for the better conditions of today, it is only necessary to visit a few of the many beekeepers who still compel their colonies to live from hand to mouth, for some have not yet learned the lesson from the period of depression from which our industry has not yet fully recovered.

VARIOUS SCHEMES FOR WIRING

Echoes of "The Thousand Dollar Trick." The Plan we Prefer.

By Iona Fowls

NO article appearing in Gleanings in Bee Culture in recent years caused such a deluge of discussions and suggestions as E. R. Root's article on wiring—the ''Thousand-dollar Trick,'' that appeared in the February issue last year. In the April issue a few of these suggestions were published; but since then, during a whole year, they have not ceased pouring into Gleanings' office, and we have accordingly decided to give our readers an idea of the nature of these suggestions and also our own experience in trying many of them out.

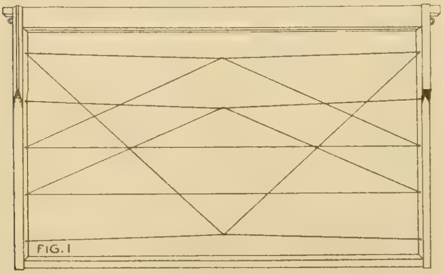


FIG. 1

Too Much Crossing of Wires.

In some of the methods there is too much crossing of the wires. One such method (Fig. 1) is given by John Arbtin, Des Moines, Iowa, as follows:

''I use Jumbo frames, and have five horizontal wires and three brace wires. The advantages of this system are that the brood-comb can not sag, the queen can lay eggs up to the top-bar, and the comb will not break down in the extractor. The disadvantages are that it takes more wire and time to fix it in this way, and it cuts up the foundation more when the wires are imbedded than the old system does.''

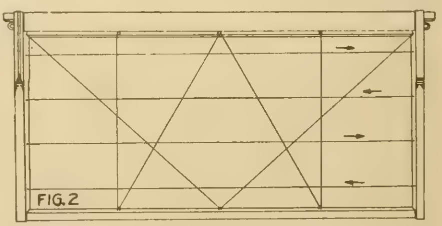


FIG. 2

A. W. Lindsay, Detroit, Mich., gives a similar plan (Fig. 2), but in this case the wire is fastened to the top-bar and bottom-bar as well as to the end-bars. This, Mr. Lindsay believes, results in combs better attached to the bottom-bar, and brood is reared nearer the top-bar.

Our experiments have shown us that,

while these methods in which there is excessive crossing of wires make a firm comb, yet, besides the extra wire required and the extra time and trouble, there are the added objections that the comb is more likely to bulge between the wires, the wire is more likely to cut the foundation, and also drone comb is often built at the intersection of the wires.

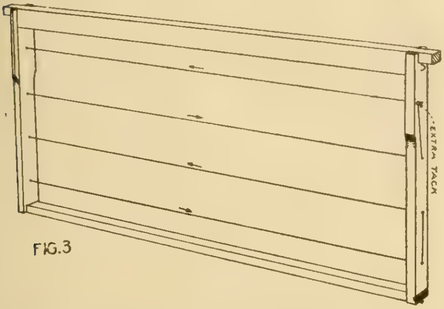


FIG. 3

Variations of Ordinary Horizontal Wiring.

An easy method, but one well worth considering, is given by J. H. Fisbeck of Missouri, who says:

"After having read the bee magazines lately, one would think that nothing more could be said concerning wiring frames; but one comes to this conclusion, however, that the effective methods are too complicated, requiring entirely too much time and labor. My plan (Fig. 3) I call the "three-tack method." Just one extra tack turns the trick. All methods prescribed call for a tight wire near the top-bar or some kind of reinforcement. With my method the frames are wired and tacked in the ordinary way except that I drive a tack along the side of the top hole in each end-bar. Placing the tacks alongside of the hole prevents the wire's sinking into the wood. The upper wire after being drawn taut is fastened at each end by these tacks. I prefer the lower wires to sag a little, to prevent the buckling of foundation in hot weather and to allow the foundation to come closer to the bottom-bar. It is the top wire which needs to be taut, and this extra tack, with the manner in which it is driven, does the work."

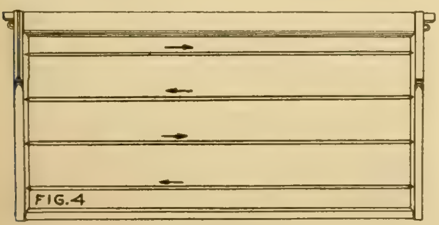


FIG. 4

It has been suggested by D. W. Switzer, Saluda, S. C., that the frames be wired in the usual way, and then four other horizontal wires be used with the foundation slipped in between the two sets of wire (Fig. 4). Altho this takes twice as long, he says: "I get splendid results in getting the queens to lay close up to the top-bars. Also, frames wired this way are fine to use when shipping bees and when extracting."

Wiring in the usual way, except that the two top wires are crossed (Fig. 5), is the method suggested by E. G. McCormick, Prairie Grove, Ark. Altho Mr. McCormick does not consider the extra space above and below the crossing of the two wires to be a serious objection, still we should greatly prefer to have the wires closer at that part of the comb. He writes as follows: "The modification, by applying the mechanical principles of the truss and suspension, furnishes strength in the upper part of the comb where it is most useful. To demonstrate the additional strength over a parallel wire, place the finger on the point marked 9 in the diagram, and press downward or upward. To wire a frame in the proposed way, commence at the hole marked 1 in the diagram, and continue as in ordinary parallel wiring to 7; from 7 carry the wire in front of, under, then back of the wire running from 5 to 6, to the hole marked 8 and fasten it. If it is desired to avoid any interference with electric imbedding, thread the wire from 5 to 7 down thru 6 and back to 8, and insert foundation between the crossed wires, depending upon the foundation and comb to bind the wires together at 9. The writer prefers the former method, and regrets that all his frames are not so wired."

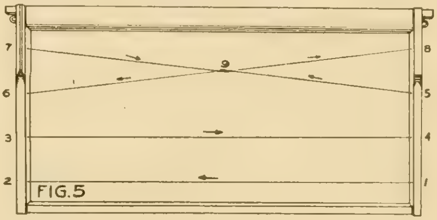


FIG. 5

Chas. S. Kinzie of Riverside, Calif., uses the same method with the two lower wires as well as the upper. He writes as follows:

"With my plan of wiring (Fig. 6), I never have any sagging. I do not cross the wire. I wire the first wire straight, then the next over the straight one. A lot of sagging is caused by the way frames are placed when extracting. If the frames are put in the

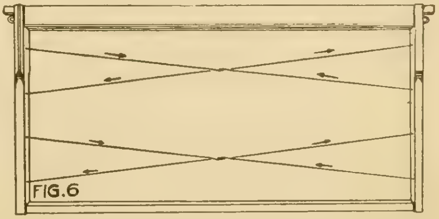


FIG. 6

baskets the first time with the top-bars toward the way you are turning, there will not be any sagging. But if the bottom is placed toward the way you are turning, then there will be some combs that break loose and sag.''

Such a looping over of the wire really amounts to two crossings at practically the same point, which, as previously explained, we have found objectionable in our experience.

All Wires Diagonal.

Wiring with all the wires diagonal (Fig. 7) is recommended by John L. Miles, Ridgway, Pa. He says: ''The illustration will show plainly how it is done. Beginning at 1, proceed to all the figures as shown. Care should be taken to get the wires from 2 to 3 and 7 to 8 on top of the ones from 4 to 5 and 8 to 9. This allows sliding the foundation between the wires and prevents short circuits when imbedding with electricity. The wires are fastened to the top-bar by driving tacks in the side of the corner cut. They should be equally spaced. I use the third hole from the top in the end-bar; and the bottom-bar, beginning at the end, should be drilled 2, 6½, 10½, and 15 inches. I have wired all my frames this way, and the bees build fine combs in them. I have not had a case where they made holes where the wires cross. In fact, the only objection I can see to this method is the time it takes to do it; and if this is an objection, then by the same token why wire them at all?''

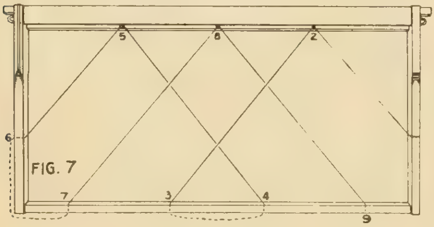


FIG. 7

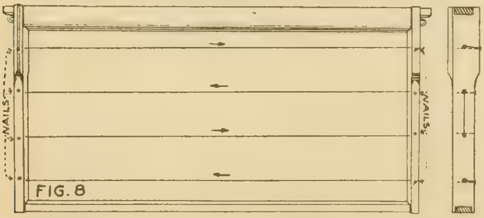


FIG. 8

Now the slight springing of the bottom-bar would probably do little harm; and so far as the theory of the braces is concerned, the plan is all right for the middle part of the frame; but there is a decided objection to those large expanses of comb unsupported by wire. Especially is this true at extracting time. More diagonal wires might overcome this objection; but this only adds to the labor of wiring and the difficulty of inserting the foundation.

To Prevent Wire From Cutting Into Wood.

For preventing the wires from cutting into the wood, the use of staples, nails, and eyelets has been suggested by many. In our experience we have not found that they prevent stretching but that they do weaken the wire at those points where the wire pulls against them. E. G. Hand of Hilliardton, Ont., has for 20 years used nails just above or below the holes, so that the wires may be drawn taut (Fig. 8). In his letter he says:

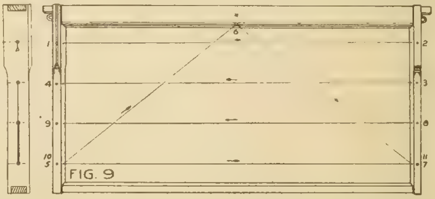


FIG. 9

''Here is the system I adopted more than 20 years ago, and I have never seen another that made me want to change. Wire nails are driven into the edge of the end-bars above or below the holes to catch the wire as soon as it is pulled tight and begins to cut in. With this system, wires can be pulled as tight as desired when put in and will keep their tension for years. There will be practically no trouble from wires breaking if judgment be used in tightening them, and experience soon teaches the proper tension. The wire should be drawn tight, one strand at a time, after it is strung thru and the end secured. Do not attempt to draw the three strands tight with one pull. I have never had trouble with wires breaking at any time after wiring. If pulled tight enough no vertical wire is needed, and the wires can be imbedded electrically. The wire is attached to the nails at the terminal holes at the outside, then the nails are driven in tight.''

A similar plan (Fig. 9) is advocated by P. M. D. Veale of Ottawa, Ont., who makes a hole thru the center of the top-bar, enlarges the holes in the end-bars with a 5/32 bit stock drill, and then drives ⅞ x 18-gauge nails into the end-bars thru the middle of the holes, so that these nails serve as axles on which the wire slips as it is pulled taut. A nail is driven in the same manner thru

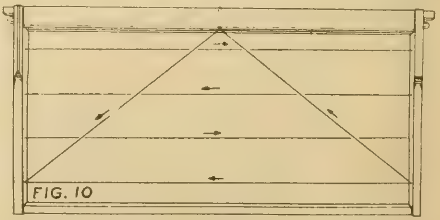


FIG. 10

the middle of the hole in the top-bar. Beginning at 1, wire as indicated in Fig. 9.

So many have advocated the use of staples or eyelets to prevent the wire from cutting into the wood, that H. H. Root decided to give them a test. His conclusions are given below in his own words:

''We wired a number of frames with No. 28 wire with eyelets in the end-bars, and also some frames with the same-sized wire but with no eyelets in the end-bars. We suspended these frames vertically by means of a string tied around the top-bar in the middle, and then put a strain on one of the strands of horizontal wire by tying a pail to one of the wires in such a way that the pail would be suspended beneath the bottom-bar of the frame. We arranged in this way two frames and two pails, one frame having eyelets and the other having no eyelets. With everything hanging free we began dipping water into each of the pails. In every instance the sag of the wire was apparently uniform until the pails held approximately five pounds of water when the wire in the eyeleted frames broke. Tho we repeated the experiment several times, the result was always the same. The eyelet makes a rather abrupt angle which weakens the wire. When there is no eyelet the wire sinks in the wood sufficiently to make a long easy curve which effectually prevents breakage. Moreover, we can see no advantage whatever, so far as the stretching of the wire was concerned, whether eyelets were used or not. It should be pointed out that the wire of today is hardly the equal of the wire of a few years ago, for it varies considerably, some being hard and some soft. The hard wire breaks easily, while the soft stretches so quickly that it may be stretched by being wound around the fingers and pulled with the two hands.''

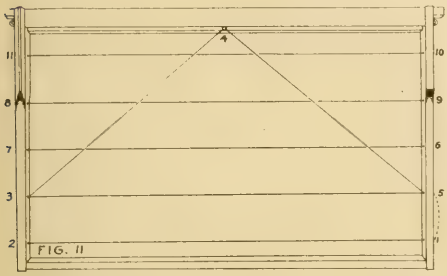


FIG. 11

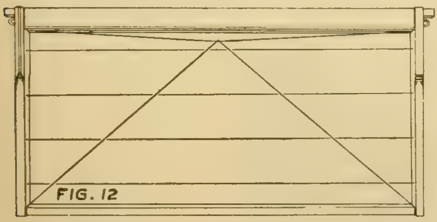


FIG. 12

Variations of the Thousand-Dollar Trick.

A number of the methods given are variations of the ''thousand-dollar trick.'' Some have found that the staple in the top-bar pulls out too readily, and therefore they thread the diagonal wire thru a hole in the top-bar, and there attach it with a nail or tack (Fig.10).

George Giesenaues, Chicago, Ill., who has Jumbo frames, threads thru five horizontal wires, fastening the free end at 11 (Fig. 11); then before cutting the wire from the spool he takes the next to the bottom wire, stretches it up to the top-bar, and fastens it over the head of a tack at 4, as was suggested by Mr. Root in Heads of Grain in the June (1920) issue. The wire is then cut from the spool, leaving sufficient length to thread back thru 5 and 3, where it is to be fastened, care being taken not to allow contact of the two wires in these holes. When the Jumbo frame is completely wired in this way, the diagonal wire is unhooked from the nail in the top-bar, the sheet of foundation slipped in place between the horizontal and the vertical wires, and the loose wire slipped back over the nail-head. This method makes it possible to use an electric imbedder without danger of a short circuit.

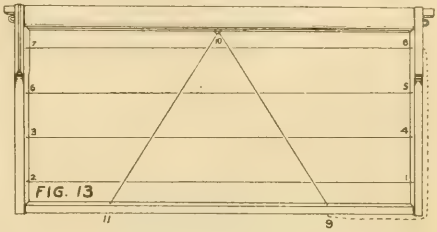


FIG. 13

A horizontal wire inserted under the ends of the top-bar, and a diagonal wire looped over the horizontal one and inserted between the lower ends of the end-bar and the bottom-bar (Fig. 12) may be placed in the frame at the time of making the frame, according to Wm. Grams, Sturgis, S. Dak. He uses these two wires in addition to the usual four horizontals. This style of wiring would doubtless hold the comb firmly; but, altho we have never tried it, it seems to us it would cause considerable trouble, and the looping of one wire over another would be likely to cause drone-cells at the very place

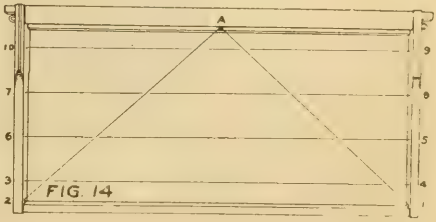


FIG. 14

where we least desire them. A looping of one wire over another is much more likely to cause such trouble than is a plain crossing of wires.

Several have suggested Mr. Root's plan, but having the ends of the diagonal wire attached to the bottom-bar instead of the end-bar.

H. M. Tarbox, Brattleboro, Vt., and others have suggested making two holes in the bottom-bar and bringing the wires over the corners, thus stiffening the bottom wires (Fig. 13). This method works well if the wires are drawn tightly without springing the bottom-bar too much.

The Plan We Like Best.

After having spent considerable time and expense in trying out many promising plans, the one that we have finally decided most satisfactory is a slight variation of the "thousand-dollar trick." The frame is pierced in the usual way with four holes in each end-bar, but in addition to this there is a 3/16 inch slot at the lower end of each end-bar.

Holding the frame with top-bar down the frame is wired horizontally thru the slots and pierced holes in the end-bars in the order indicated by the numbers (Fig. 14) and the wire is fastened at 10. The foundation is then placed on top of the horizontal wires, a tack driven thru the foundation and part way into the side of the groove in the top-bar. The wire next the bottom-bar is then made slack and slipped over the tack at A and after being drawn taut is fastened at 1, after which the tack in the top-bar is driven clear in, the wedge tacked in place and the wire imbedded electrically.

If imbedded too deeply the wires cut the foundation, the bees make the holes still larger and then build in drone comb; therefore we advise that the wires be imbedded only on the surface of the foundation. Last summer we had hundreds of frames wired as shown in Figure 14, with no trouble from stretching or buckling of foundation. Nor were there any drone-cells at the crossing of the wires when the foundation was imbedded properly. On the whole we have found the plan a good one and one that requires but little extra work.

A Concluding Word.

The plans of wiring given in this article are only a few of the very many submitted. But some of these were the same, or so similar to some one of the plans mentioned above, that it would have been mere repetition to print them. Many other plans submitted were too impractical to deserve space being given to them. But out of the whole mass of correspondence regarding wiring received by us during the last year, we have endeavored to select the best ideas and give these to our readers along with explanatory drawings.

A mile of California almond trees in bloom in February.

FROM THE FIELD OF EXPERIENCE

RETAIL HONEY CONTAINERS

An Attractive Glass Package for Six and Twelve Pounds of Honey

It is five years since we have used tin pails to supply retail trade. Instead we have used and are still using a six-pound and a twelve-pound glass jug. We have used several thousands of these jugs and are so well pleased with them that we would not consider using tin pails again, unless it should become impossible to buy the jugs.

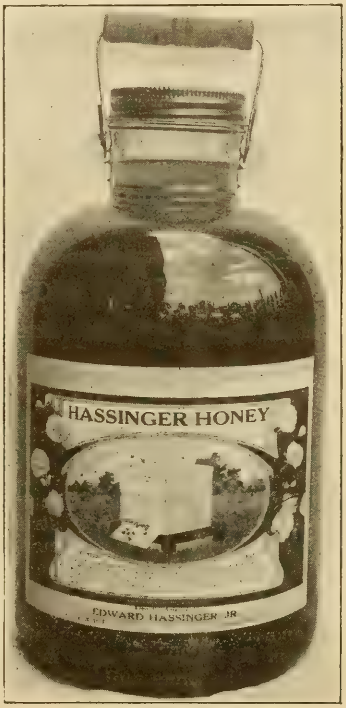
These jugs are a complete success in selling themselves. The white flint glass shows the honey in its natural color. The jug being of convenient size and neatly labeled, with the wood and wire handle, makes as pretty and attractive container as any one would wish to see. To see one is to want one.

We firmly believe that a display of these jugs in several downtown store windows in our cities and villages will sell more honey than a four-by-four-inch advertisement in the local daily paper of that town. We have tried it a few times, and the results were in favor of the window displays.

As a return package it is a success; that is, after people have more of these jugs than they can use for household purposes they are anxious to return them to us. So we buy them back at the same price that we charged for the jug when sold with the honey; that is, if we sell the honey at 30c a pound, a six-pound jug would amount to $1.80 and 15c for the jug; total $1.95. In handling the jugs we take a double sheet of newspaper, or other wrapping paper and fold it around the jug, drawing it a little tighter at the top; then the top edge of the paper is folded down enough so that an ordinary stickpin may be inserted. This allows the jug to be carried by the handle without the wrapper's slipping off. To remove the wrapper it is slipped up over the top. In handling larger quantities, say half a dozen or more, we use the wooden shipping case that is made to hold two 60-pound tin cans. This case will hold six 6-pound jugs, with room to pack the corners with wads of paper, to hold them firmly. We use this same case to ship six 6-pound jugs to retailers by packing the bottom and the top with marsh hay or straw and the sides and ends with paper. We have shipped in this way by express for over 100 miles, usually successfully.

In washing the jugs, or any other glass in hot water, to prevent breaking, one-half of the open end of the mouth of the jug is dipped into the water first and the water allowed to run down on the inside. At the same time the outside of the jug is laid down into the water; then it is rolled over to allow the opposite side to come in contact with the hot water. This method of handling glass in hot water allows the glass to expand without breaking. If anything is inside of the jugs that cannot be removed by shaking with only hot water, a small handful of lead shot is used to shake with the water.

If the National Honey Producers' League would see fit to adopt these jugs as standard retail honey containers, we believe it would be a move that would bring more direct results in moving honey to the consumer than any other means of advertising could bring at the present time, considering that this would cost practically nothing, with the exception that extra care must be exercised to have the honey and the jugs clean.



The glass honey jug, several thousand of which Mr. Hassinger has used in marketing honey.

The one-half gallon jugs at the last quotation were $25.25 per gross. The one-gallon sizes sold at $35.50 per gross, f. o. b. Chicago, or Alton, Ill. This would be 17½c each jug for the one-half gallon size, and 24 2-3c each for the gallon size. Before the war I bought them for 7c and 10c each, respectively. Since the consumer pays for the jug extra and has the privilege of returning the empty jug at the same price paid for it, the price does not make so much difference. However, it would be an advantage to both the producer and the consumer if the jugs were less costly; less money would be invested and the loss would be less if a jug is accidentally broken. I believe the price could be reduced considerably if all the progressive honey producers would use them, as the demand would thereby be increased so that the factory could put in full time making them.

Perhaps bee supply companies could be induced to order the jugs by the carload and advertise in their catalogs to sell to honey producers at cost. Let's ask them to do this for the good of the cause. To advertise honey in this way is to increase the demand, thereby encouraging a uniform and fair price for honey in a standard package, as a staple article to be found in any store in the United States.

Greenville, Wis. Edward Hassinger, Jr.

* * *

NAILS AND NAILING

Proper Sizes and Spacing of Nails for Best Results

The U. S. Forest Products Laboratory has by experiments arrived at some conclusions regarding the economical ways of nailing wood that should be of general interest to beekeepers.

Probably a majority of beekeepers use too few nails, while quite a number of people in an endeavor to make a strong job overdo the matter by driving so many nails that they split the ends of the boards. Not a few use the wrong kind and size of nail for greatest security.

It is reported that the cement-coated nail has from 10 to 30 per cent more holding power than the same nail not coated. In most cases the barbed nail had the least holding power of any. The short nail of large diameter has small holding power, while the long slender nail lets go by its breaking. The stout nails are better for hard woods, and the long slender ones for soft woods.

For woods of medium hardness, the nails should be of the same penny as the thickness of the board in eighths of an inch; that is, 4-penny for a half-inch board, and 8-penny for an inch board.

Six-penny nails should be spaced 1¾ to 2 inches apart, and the space increased about ¼ inch for each additional penny in size; so that 8-penny nails should be spaced about 2½ inches apart.

I might add to the above information from the Forest Laboratory, that when white pine and basswood were plentiful and cheap and most generally used by beekeepers east of the Rocky Mountains, there was little danger of using too many nails, as those woods did not check easily by nailing. But now when cheaper woods like spruce, fir, redwood, and hemlock are so much in use, especial care needs to be exercised in nailing, as these woods split easily.

In this era of expensive lumber, high freight rates, and comparatively cheap nails, it is advisable to use as light lumber and as many nails as the wood will stand in making up shipping crates and cases.

Do not fail to remember that according to the experiments related above, cement-coated nails have the greatest holding power, for wire nails; smooth nails next, and barbed nails least, in most instances.

Some years ago the army engineers at the Watertown Arsenal found by experiments that cut nails of the same length as wire nails had an average of about 60 per cent more holding power than wire nails. But as cut nails are higher in price than wire nails, very few are used at present.

As the word ''penny,'' as applied to the size of nails, is all ''Greek'' to people in some sections of the country, I might state that originally an 8-penny nail weighed about 8 pennyweights, and a 40-penny spike about 40 pennyweights. Nails made now are lighter in weight, but the lengths remain the same. A 4-penny nail, that is, 4-penny size, is 1½ inches long; 6-penny, 2 inches long; 8-penny, 2½ inches long; 10-penny, 3 inches long; 12-penny, 3¼ inches long.

However, they are liable to vary about ⅛ of an inch from the above figures, which are for ''common'' nails. ''Fine'' or finishing nails, are not much used by beekeepers, as the heads are so small that they draw thru soft woods. A. N. Clark.

Charlotte, Mich.

* * *

EXTRA CHAMBER FOR STORES

Shallow Extracting-super for Stores, and Brood-chamber for Brood

Many of us are convinced that for beekeepers, in the northern sections of the country especially, the Langstroth frame is not deep enough; and, consequently, many arguments are being presented in favor of the Jumbo or Quinby frame, or the 12 or 13 frame Langstroth hive. I think we had better go slowly in making such a change. For wintering, perhaps the deep frame is superior; but for all-around purposes the Langstroth frame is superior.

Very few beekeepers now use the Lang-

FROM THE FIELD OF EXPERIENCE

stroth hive alone as the brood-chamber thruout the season. This brings me to the arrangement which I think surpasses the deep or large hives; that is, the 1½-story Langstroth hive. You say that method has been recommended often before; but simply placing a shallow super over the brood-chamber without the proper conditions will not suffice. You must have some good dark brood-combs in both chambers; that is, having worker-cells to the top-bars in the Langstroth chamber, and worker-cells to the bottom-bars of at least six old brood-combs in the shallow super, thus bringing the brood-nests of both chambers as close together as possible. You should have four shallow combs of honey per colony saved for spring feeding. It is best to have a queen-excluder over the shallow brood-chamber thru the season. So much for equipment; now for the manipulation.

There must not be a rim of honey around the brood when the queen is laying in full swing. This is what makes a large hive become small, and the condition is hard to eliminate in deeper hives. The presence of too much pollen and granulated honey is more prevalent in deep or large hives, owing to swarming or poor queens, which also reduces the brood capacity of the hive.

To prevent this rim of honey around the brood in late spring, enough stores for winter are given to hold them until the putting on of the shallow brood-chamber, which has at least two full combs of stores on each side of the six shallow brood-combs. This means that the center combs below have brood to the top-bars with some honey in the side combs; and the placing of these nice, warm brood-combs directly over the brood (with the addition of 12 pounds of honey) entices the queen above immediately. By actual count, nine out of every ten queens were laying upstairs the second day. You must now get these shallow brood-combs filled with brood (even tho you have to remove temporarily two or three Langstroth combs, below which the queen has not occupied) before the honey flow starts, to start bees storing their honey in the super, which is placed above the shallow brood-chamber. When the rim of honey is established away up there you can replace the Langstroth combs (which were temporarily removed) without any danger of the bees' restricting the queen in laying by filling them with honey; and they maintain this size of brood-nest thruout the greater part of the season of extensive brood-rearing. This equals or surpasses almost any deep or large hive. The secret lies in getting the queens upstairs early into the shallow brood-chamber, so the first honey is stored far above the brood in the super.

During the swarming season you can tell almost invariably which colonies will swarm by tilting the shallow brood-chamber to see if any cells are built. By simply destroying cells you can discourage almost all of these cell-builders. This beats examining frames in deep hives.

I prefer adding this brood-chamber in spring to leaving it on thru the winter, as it proves more efficacious in preventing swarming. Let me say that Langstroth hives packed in pairs or fours, pushed together, can be arranged to hold at least 40 pounds, and at the same time provide a clustering place. Simply place two empty combs on the side adjacent to the other hive, after providing the colony with eight sealed combs of stores—enough stores for almost every location. This meets another argument of the deep-and-large hive advocates.

St. Louis, Mo. J. H. Fisbeck.

WINTER PACKING-CASES

Summer and Winter Arrangement for the Quadruple Case

The accompanying pictures show a few novel features of my apiary practice which may be interesting to the readers of Gleanings.

I am a sideliner of only five years' experience; but as I have developed my apiaries from two colonies in May, 1915, to over 300 in October, 1920, I have learned many things, and have found several opportunities to improve upon equipments and practices as found in most apiaries. I aim to have all of my equipment standard and interchangeable in my own apiaries; but you will note some things not mentioned in supply catalogs.

Fig 1.—Summer arrangement for packing in groups of four

Picture No. 1 shows a view of one of my apiaries with the summer arrangement. My bees are all grouped on platforms which are part of the winter packing-cases. The platforms are arranged in rows running either north and south or east and west—prefer-

FROM THE FIELD OF EXPERIENCE

ably east and west—and leveled up before the hives are placed upon them. The bottom-board is of original design to facilitate packing for winter and to allow air to circulate freely under it when standing on the platform. The standard bottom-board, resting flat on the platform, holds moisture and also rots the boards. My bottom-board is half the length of the platform, so that, when arranged for winter, it fits snugly inside the winter case, and a six-inch board laid across in front of the hive provides the channel to the outside of the case.

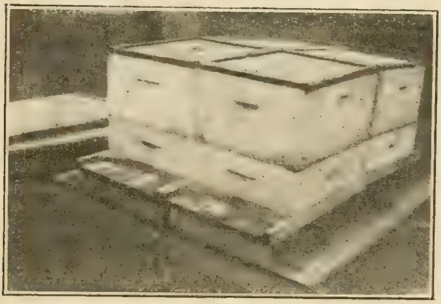


Fig. 2.—Hives raised up to permit packing below.

Picture No. 2 shows the hives closed up and raised off the platform for winter packing. I find it worth while to keep a shallow super under the brood-chamber both winter and summer.

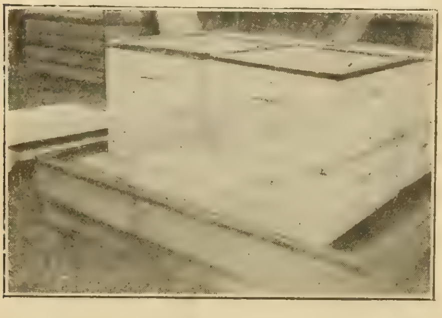


Fig. 3.—Rim in position ready for packing material beneath the hives.

Picture No. 3 shows the bottom rim of the winter case in position, and the front end of the bottom-board covered to give a clear bee-space to the auger-holes in the rim.

Picture No. 4 shows the end panels in position. The cleats on the end panels project about four inches on the lower edge and interlock with cleats on the sides of the bottom rim, thus holding the end panels in position as seen in the picture. The cleats on the side panels are long enough on the lower edge to catch inside the bottom rim, and the ends of the sides abut against the cleats in the end panels, making a nail or hook at each upper corner all that is necessary to hold the case firmly together. The cover is in two parts, the end cleats fitting outside the case. The roofing material is allowed to project two inches on one of the halves so as to make a lap joint at the peak and prevent rain or snow from getting into the case.

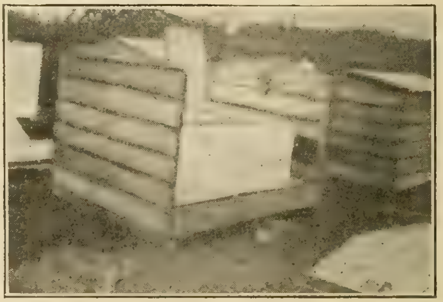


Fig. 4.—End panels held in place by projecting cleats which fit into sockets in the bottom rim.

Picture No. 5 shows the winter cases in position. The details of the construction of the winter case have taken several years to perfect; but now I seem to have gotten it about to suit my taste, and shall have 78 in use this winter. A. Gordon Dye.

Rochester, N. Y.

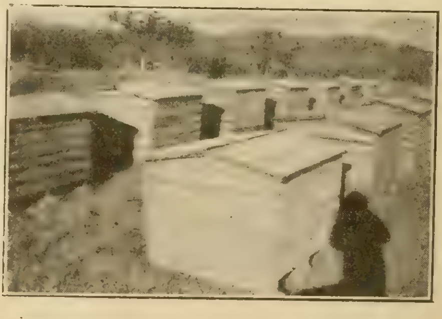


Fig. 5.—Winter cases in position.

[Two features in Mr. Dye's winter cases should be emphasized: (1) The bottom rim of the winter case (Fig. 3), together with the method of raising the hives from the floor, makes it unnecessary to lift the hives from their summer stand to put the bottom packing in place. (2) The projecting cleats at the lower edge of the ends and sides fitting behind cleats in the bottom rim hold the ends of the winter case in position (Fig. 4) before the side pieces are put in place, so that one man can assemble the case.—Editor.]

SIFTINGS

J. E. Crane

IT seems evident from the illustration on page 40, January Gleanings, that Bill Mellvir has heard of Jay Smith's slogan, "Keep more bees per hive," and put it into practice. No wonder the assembled crowd look on with wonder at results, and it is results that count.

* * *

That illustration, page 37, of a healthy baby brought up by the use of honey from the very gate of death shows that there is something about honey as an article of food that is not yet fully understood. Who can tell the number of children that have died for the lack of honey!

* * *

"Beekeeping in Foreign Lands," by E. L. Sechrist, page 20, is of much interest, especially what he calls "spring dwindling," which shows that there, as here, it is the result of exhaustion of old bees; and this again shows very conclusively that the more quiet bees can be kept from the time they stop breeding in the fall until they begin in the spring, the better.

* * *

That wax press illustrated on page 28 and described by Mr. Holtermann looks good, but I am interested in knowing whether any one has ever melted up one of those cakes that look so dry to find out just the percentage of honey and wax. One of the surprises of my life was to discover the large amount of honey remaining in cappings that appeared comparatively dry.

* * *

On page 17 Mr. Demuth writes of the difference in the amount of honey in the brood-chamber of a hive run for comb honey and one run for extracted honey. My own experience is that hives run for comb honey will in the fall be found to have on an average two or three times as much honey stored for winter use as those run for extracted honey. For this reason we are apt to overestimate the amount of surplus from colonies run for extracted honey.

* * *

Inquiry is made on page 9 if "beekeepers realize how much their prosperity depends on the character of the soil in their respective localities." Probably they do not, but we have observed that here in Vermont we get our best yields of clover honey from the heavy clay soils of the Champlain valley of western Vermont. For some years it has seemed to me that we are likely to get our best flow of honey from any particular plant when located in the soil and environment best adapted to its most perfect development. We cannot expect to get blueberry honey from a limestone soil any more than clover honey from an acid soil. There is another way in which soil appears of interest to beekeepers. European foul brood is much more virulent on some soils and in some locations than others. In some sections it will disappear of itself, while in others it is almost impossible to eradicate it.

* * *

The statements made by H. B. Parks, page 25, on the desirability of "Advertising Backed up by a Constant Supply" of honey, are well worth the careful attention of beekeepers east and west. Extensive advertising can not be expected except by extensive beekeepers' organizations, which shows the necessity of such organizations. More and more, honey is becoming a staple article in grocery stores in many sections, notwithstanding the lack of organization of beekeepers, for bottlers and large beekeepers are working along this line, but there is an immense territory yet to be covered.

* * *

That picture of beehives and castor beans, on page 27, looks all right certainly; but here in Vermont, with our cooler summers, the beans would not grow tall enough to be of much value in average years. Where shade is desired it has seemed to me that nothing will so perfectly fill the bill as staghorn sumac. It spreads out evenly seven to ten feet above the ground, and grows from suckers sufficiently so one planting will remain for many years. But after all I prefer to keep bees in the open, except for a few small shrubs to assist the bees in finding their hives, since one can see so much better to work. I have often found it difficult to find queens or eggs or queen-cells where there is much shade.

* * *

That is a right good article by E. Wynne Boyden. I was expecting something good from him along this line later. "Honey in the Sweet Family" should be read and reread by every young beekeeper and many old ones until this little sugar family is thoroly understood. We cannot become too well acquainted with this interesting family, for we have to do with it every day of our lives. But there is one thing I don't quite understand. Mr. Boyden tells us that levulose is worth some $50 a pound, and I learned long ago that average honey was 40 per cent levulose. Now, if I eat five ounces of honey on my griddle cakes of a morning, an average amount, I shall swallow six dollars worth of levulose. I really didn't think I was so extravagant, but it must be so if he says so.

OUR FOOD PAGE

CONSTANCE ROOT BOYDEN
Stancy Puerden

SOMETIMES I wonder if there is any other food writer in the country situated just as I am. You who have been subscribers for many years know that Gleanings has always catered to beekeepers only, and as the majority of beekeepers are men, in spite of a few capable exceptions, the majority of Gleanings readers are men, and the editors expect me to conduct a food page that will please them as well as their wives. Now, I have just one way of judging whether what I write is acceptable or not, and that is by the letters I receive, and it has been noticeable that when I write of some household convenience I receive many letters from nice men who are interested and wish to duplicate it for their wives.

How often does your wife sweep her kitchen, Mr. Beekeeper? You may not know, and of course it is none of my business, but I know that if she is an average housekeeper she does it at least 365 times a year. If she is exceptionally neat she may do it oftener, say twice that. If she is exceptionally untidy, or put it unfortunate, in dropping crumbs, etc., on the floor, she probably has to do it oftener or have the litter tracked all over the dining room and living room. And each and every time that kitchen is swept the dustpan and perhaps a whisk broom are brought from their hooks, closet, or shelf, the sweeper must stoop, brush up the dust, empty the dustpan in a trash basket on the back porch or out of doors, and return the dustpan and whisk broom to their appointed place. Theoretically I don't mind stooping frequently, for it probably helps keep one slender, but actually when I am tired and in a hurry I have noticed that I would rather walk a great many steps than stoop.

Then, too, I have found myself trying to estimate how much time would be saved if the floor would open up and swallow that dust when I had it swept into a neat pile. Only a minute, someone may argue; but when you multiply that minute by 365 or 730 or maybe 1,000 you have a number of hours saved in a year, hours that could be spent so much more pleasantly and profitably.

To come to the point in my story, when I sweep my kitchen now I sweep toward the gas range, and when the sweepings are collected in a heap just below the front of the range, which is the high variety with plenty of room under it, I pull a strong cord, attached at a convenient height to the near-by wall, the floor opens up, I joyfully sweep the dust into the opening, with a turn of the wrist close it, hang up the broom in the stairway to the basement, the door of which is close by, and depart from the kitchen with that feeling of satisfaction imparted by a task easily and quickly accomplished.

It is even more convenient than I anticipated. You know how often a few crumbs, nutshells, and the like are scattered on the floor when a member of the family is hungry and helps himself to something between meals. (That masculine pronoun was used in place of the singular, common, personal pronoun which English lacks. No personal reflections were intended.) Also when flour or other supplies are put in the cabinet a little is liable to be spilled on the floor. With the dust chute it is a simple matter to have the floor tidy again in a moment.

Another thing, if you men know anything about sweeping a bare floor you know how hard it is to corral all the ''fluff'' in a dustpan. Also the fine dust has a most irritating fashion of slipping under the edge of the dustpan instead of into it. I find it much easier to coax them both down the chute.

But the best part of this little convenience is that there is no reason why every housekeeper should not have one similar. Ours was made in a few hours by our seventeen-year-old son during his holiday vacation from college. He sawed thru the double floor and the inlaid linoleum, which is firmly cemented to the floor, cutting out a section 10 by 12 inches. Hinges on the back of this, a stop below the front edge, and a flat, iron bar firmly fastened down, with a loop in the end thru which to pass the strong cord which lifts it, complete an easily raised trap door which is so inconspicuous that it is hardly noticed. In the basement a light drygoods box is fitted between the floor joists just under the opening into the kitchen and fastened in place by an easily turned button. I imagine once a month will be quite often enough to empty the box.

Just at this point my New England conscience, or Western Reserve conscience, which is the same thing, forces me to explain that an ingenious brother had this sort of a dust chute in his kitchen years before we did. Since ours has been in operation my only regret is that we did not have it years ago, and I cannot understand why so many kitchens are without them. Practically all modern houses are built with clothes chutes, but the dust chute, which I consider even more of a convenience than the clothes chute, is so rare that I never saw more than one before we had our own. If you wish your wife to have kind thoughts of you at least once a day, Mr. Subscriber, just try making her a dust chute. If she is situated as most of us are for household help, there is no danger of removing so much of the work from housework that she will not get enough exercise.

THE housekeeper who can make good baking powder biscuits has the foundation for many choice recipes. Below I am giving several standard recipes for the foundation biscuit, with suggestions for a few of the tempting dishes which can be made from the foundation recipe. An inventive housekeeper will be able to think of as many more.

The drop biscuits are so easy that a child can make them successfully, and they are quite as good for certain purposes as those rolled and cut. For breakfast biscuits the flour, baking powder, salt, and shortening may be mixed the evening before. Then in the morning add the liquid and make the drop or rolled biscuits, as preferred. As small biscuits may be baked in 10 to 12 minutes it is a simple matter to have a pan of hot biscuits for breakfast without rising any earlier than necessary to make coffee and heat the ready prepared breakfast cereals.

The exact amount of liquid needed in a biscuit recipe cannot be stated, as the various flours vary so much in absorbing powers. Milk, milk and water, or all water may be used. I generally use skimmed milk.

Any kind of well-flavored fat may be used in biscuits. Chicken fat may be used for part or all the shortening, especially when the biscuits are to be served with a chicken stew poured over them. Oleomargarine gives very good flavor and texture.

The amount of shortening may be varied to suit the individual taste. For rich shortcake or baked dumplings the amount of shortening may be doubled or even more, but for the family use a very good shortcake may be made with the standard recipe for biscuits. Steamed dumplings may be made with very much less shortening, especially when served with meat stews, or they may be made with no shortening at all.

The standard recipe may easily be divided or increased by keeping the proportions the same, 2 level teaspoons of baking powder, 1 tablespoon of shortening, and ¼ teaspoon salt for every level cup of sifted flour. Use a little more salt if an unsalted shortening is used.

DROP BISCUITS

2 cups sifted flour　　2 tablespoons shortening
4 teaspoons baking powder　　½ teaspoon salt
about ⅞ cup milk or water

Sift the flour, baking powder, and salt into a mixing bowl, cut in the shortening with 2 knives or work it in with the finger tips, mix the milk in gradually with a knife until you have a dough that will just keep its shape without spreading. Take a heaping teaspoonful, push it off on to an oiled pan or sheet with a knife, flatten it slightly, and bake in a hot oven 10 to 15 minutes or until lightly browned. The biscuits should be about 2 inches apart.

CUT BISCUITS

2 cups sifted flour　　½ teaspoon salt
4 teaspoons baking powder　　2 tablespoons shortening
about ¾ cup milk or water

Mix as in the preceding recipe, using just enough liquid to make a dough which is easy to handle. Pat the dough into shape on a lightly floured board, roll out lightly about half an inch thick, cut with a biscuit cutter which has been dipped in flour, arrange on a pan or baking sheet so that the edges do not quite touch each other, and bake in a hot oven 10 to 15 minutes or until delicately browned. The pan need not be oiled for cut biscuits as they are not apt to stick. Brushing the surface with cream just before baking gives a delicious crust.

SWEET CREAM BISCUITS

2 cups sifted flour　　1 teaspoon salt
4 teaspoons baking powder　　Sweet cream

Sift the dry ingredients into mixing bowl as in preceding recipes, add the cream slowly to make a dough, and drop or roll as preferred. If the cream is very heavy, part milk may be used.

WHOLE WHEAT BISCUITS

Mix and bake as in any of the preceding recipes, substituting whole wheat flour for half the white flour. All whole wheat flour may be used if it is a brand that is finely ground.

NUT BISCUITS

Use one of the standard recipes and add ½ cup nuts cut small and 2 tablespoons sugar to the dry ingredients, or omit the sugar and eat the nut biscuits with honey.

JAM BISCUITS

Use the standard recipe for cut biscuits, roll ¼ inch thick, cut, spread half the biscuits with jam, place another biscuit on top of each, press the edges together, brush the tops with cream, and bake as usual.

CHEESE BISCUITS

Make the biscuits as in the preceding recipe, but spread the lower round thickly with grated cheese instead of jam.

SAVORY BISCUITS

Make the biscuits as in the preceding recipes, spreading the lower round with cooked sausage instead of jam or cheese, or deviled ham may be used.

QUICK PARKERHOUSE ROLLS

Use the standard recipe for cut biscuits, roll as usual, spread with softened butter, crease thru the center with a knife, fold over and bake in a quick oven.

CINNAMON ROLLS

Use the standard recipe for cut biscuits, roll out about ¼ inch thick, spread lightly with softened butter, then with light brown sugar in which cinnamon has been mixed, ½ teaspoon to ½ cup sugar, roll up, and with a sharp knife cut in 1-inch sections, and bake in a well-oiled pan, cut side down. Honey may be used instead of the sugar.

(Continued on page 121.)

Beekeeping as a Side Line

Grace Allen

ONE reason that beekeeping makes such a charming sideline is that the almost unlimited delight which the bees themselves offer is reflected in their natural surroundings and emphasized in the subjects with which they are most closely allied.

Their own charm is one of a myriad details. The life story of the bee is poetry, romance, wonder, science, mystery combined, a story which must be told before we are done with this subject of beekeeping as a sideline. Then there is the joy of their humming, their flashing wings, their far voyages across oceans of light, the precious treasure they bring home, their complex—one is tempted to say personality (Oh, well, let one say it for once!)—their complex and elusive personality, the ordered wonder of their crowded lives and the mystery that, in spite of the most laborious research of the scientists of many years, still hangs about them.

Then all the charm of this is caught up, as it were, and woven into a still more irresistible whole by the things that are naturally around them; the growing things of living green, flowers of almost unbelievable beauty and fragrance, birds like bits of earth's ecstasy that have taken form and wings, to fly singing towards God; and all around, the sun-shot air; beneath, the ancient earth; and above, the holy and immeasurable sky. This is all in beekeeping.

Then the things it links itself with!—fruits and clovers, till one glimpses the whole wide field of agriculture; other insects, till one stands amazed at what entomology reveals; trees and wild flowers, pollination, adaptation, botany, science, evolution, till one feels life widening, stretching away into far lands, into dim bygone ages, into strange unguessed things to come.

Imagine some business man, of a town or the suburbs of a large city, who has recently put a hive of bees into his back yard. The first spring he will scarcely know where his little workers get those earliest loads of pollen that come in almost before old winter has really gone. But when fruit trees come into bloom, either in his own or his neighbor's yard, there he will see his bees at work, there he will hear them. Some of the keenest joys of eye and ear and of deep rapturous emotion are those that float down to the beekeeper while he stands under his blossomed apple tree or the pink-petaled peach, the fairy-like plum or the magic of a cherry tree in spring, and fills his inner being with the mingled sense of sound and beauty and delicate fragrance. If bad weather keep the bees away at this time, not only do the bees and the beekeeper lose, but the apple trees also. This he soon learns; and later, perhaps by bitter experience, he discovers that the poisonous sprays used by orchardists to destroy insect pests sometimes destroy insect friends as well. So he will become a spreader of the gospel of spraying only before and after blooming instead of while open blossoms extend their invitations to their important friends, the bees.

When clover time comes, he will learn that unnumbered tons of the finest honey are produced yearly from the dwarf or Dutch white clover, and he will watch to know the signs of its coming. He will develop a speaking acquaintance with other clovers, alsike, crimson clover, sweet clover, that once-reputed evil weed. "How can my bees have more of these?" he will wonder, and gradually comes the understanding of their value to farmers and the consequently constantly increasing acreage. Later, when he speaks of clovers, he may learn to talk about inoculation and lime. Gradually the whole important subject of soils will begin to interest him.

In these days all insect life grows more attractive to him. Wasps and hornets and bumblebees take on new interest. How marvelous the mud or paper nests! He finds the life story of his bees—egg, larva, pupa, creature with wings—running with countless variations thru the lives of many old and new insect acquaintances. Perhaps to his amazement he learns that there are hundreds of kinds of bees besides the few he knows. He watches with new interest all flying things until, by reading and observation stimulated by reading, he comes to recognize many by name. He will likely be heard telling the children new bits of information. When they hear the shrill diminuendo sounding from tall trees in summer, he will tell them of the vibrating little drums heads of the male cicada. Or when the humble cricket, serenading his lady by rubbing his wings together, chirps on the hearth in autumn, he will enjoy telling someone, his lady perhaps, how the crickets' ears are not on their heads, but down on their legs. He will begin to study ants, to prove to his own satisfaction that they are less intelligent than his bees, surprising himself likely, by the similarities discovered. Learning the nature of honeydew, he will be led to a closer study of aphides. Moths and gay colorful butterflies will fly into the ever widening circle of his awaking interest and find in him a new friend. Not an impartial one, however. Around his hive at dusk will sometimes flutter a small sly creature borne on reddish-brown wings, which he comes to know as the wax moth; and tho, being a careful beekeeper, he has no fear of finding her or her progeny in his hive, yet he dislikes them heartily. He may notice, or read, that the night-flying insects, particularly the moths, visit white flowers chiefly, or flowers heavily scented.

Reading more, observing more, he comes gradually to realize that his former vague ideas of pollination were pitifully rudimentary. Slowly he becomes aware of a great system spreading out before him, and while he may never master any department of natural science, he will find his whole appreciative soul deepened and enriched by the things he continues to learn. He could never write a treatise on it or become a teacher, yet he feels that he is touching the very stuff of life, the very story of its development.

When he finally learns that that early pollen brought to his hive is from the early-blooming trees, the elms and maples and willows, he probably exclaims in amazement, city-bred that he is, ''And I didn't even know that those trees had blossoms!'' And he will wonder how the bees knew—until, reading, he finds that trained minds have wondered that before him. Now when he sees his apple tree in bloom, ''There,'' he will think, his books having given direction to his thinking, ''is a tree that surely needs the bees, for it offers them color, odor, nectar, and pollen.'' And he understands anew why an apiary is profitable for an orchardist, even tho he should get no honey.

By this time he is caught in a very web of ''nature study.'' He gets great books from the library, feverishly hoping each one is authoritative, that everything he reads may be true, tho he well knows how man flounders about thru many errors in his search for truth.

Reading away on the endless and now, to his enthusiastic beekeeping soul, endlessly fascinating subject of pollination, he learns in Gray, ''the gentle Gray,'' someone calls him, of the wind-fertilizable plants, like the Pines and Birches and Oaks and most Grasses, that ''they produce a superabundance of very light pollen, adapted to be wind-borne; and they offer neither nectar to feed winged insects, nor fragrance nor bright colors to attract them.'' In later spring, looking up at these trees, he can fairly see them shrug huge primitive shoulders—why put color into their blossoms, or odor or nectar—little need have they of bees and other insects—do not the winds attend to their fertilization?

At last, finding himself drawn more and more towards this great ocean-like subject of adaptation, he first shakes off the clinging heavy old superstition that the beauty of earth exists simply for man's pleasure—and then he dives boldly in. And when he comes splashing to the surface to breathe blowing the foam of classic terminology from his lips he bears in his hands many curious things, priceless treasures of real truth, scraps of brilliant guesswork, gems of deep learning, vague conjectures and strange contradictions. But like any amateur diver, he loves them all, and he spreads them all out to dry and to keep. And he looks them over often, fondling them.

''Of the two (color and odor) odor is much more important,'' he cons one over, thus. ''Insects are short-sighted and are thought to be usually color-blind; the honeybee is the only insect which has been positively proved to have a sense of color. (A little thrill here, as of family pride.) Fragrant flowers which are inconspicuous are visited much more than are showy ones which have no odor. Night-flying moths locate flowers readily by their fragrance. There is reason to believe that many insects detect odors which we are quite unable to perceive.''

Again: ''Wind pollination is the simplest form. It is also the most ancient. Insect-pollinated plants came from ancestors that were wind-pollinated.'' A litle gasp, here, as at a sudden turn in a road, with a wide vista breaking in view.

Then this: ''It is equally certain that the beautiful perfume and the nectar also are, in their present development, the outcome of repeated insect selection.''

Then this, with many skips along the way: ''Evolution teaches us that asters and all the triumphant horde of composites were once very different flowers from what we see today. Thru ages of natural selection, having finally arrived at the most successful adaptation of their various parts to their surroundings, they are now overrunning the earth. Doubtless the aster's remote ancestors were simple green leaves, and depended upon the wind to transfer their pollen. Then some rudimentary flower changed, gradually took on color to attract insects. As flowers and insects developed side by side, and there came to be a better and better understanding between them, mutual adaptation followed. The flowers that offered the best advertisement—'' Feverishly he finishes that one and turns to this:

''Science has proved that almost every blossom in the world is everything it is because of its necessity to attract insect friends or to repel its foes—its form, mechanism, color, markings, odor, time of opening and closing, and its season of blooming being the result of natural selection by that special insect upon which each depends more or less absolutely for help in perpetuating its species.''

Perhaps some day in early June our new beekeeper, who has thus found his sideline to have these mighty sidelines of its own, will take some common flower in his hand, a clover blossom, perhaps, or a dandelion, and, stirred by all these suggestions of age-old purposes and marvelous processes, he will see in it now history and prophecy and divine intent.

FROM NORTH, EAST, WEST AND SOUTH

In Southern California. We continued our trip from the Roosevelt Dam toward home by way of Phoenix and on across Arizona to Yuma. The Imperial Valley and San Diego County, both in California, were also visited on the way. The beekeepers we met on our trip were, generally speaking, in an optimistic frame of mind. While some of them had their crop of honey on hand, they did not seem at all discouraged. All with whom we talked seemed to have a very friendly feeling toward the idea of organization and look upon the Exchange plan with favor. Especially is this true as regards the selling of the products. It seems to me that the greater part of the honey produced west of the Rocky Mountains might be put into one pool. What the writer means is that if the honey was put into three grades, the white in one, and the dark in another, it would leave perhaps from 70 to 85 per cent that could be placed on the market to good advantage in one pool. The white honey will always sell without effort, and the dark is used in the manufacture of various articles and sells at a lower price, leaving a good light amber table honey to be taken care of, which is the grade that needs our very best efforts to place properly on the markets of the world.

The container is another item that we can well afford to spend much thought upon. The great waste that is going on from year to year, with the present method of putting honey in sixty-pound cans and charging it all to the loss side of the ledger of the producer, should be improved upon. As only a small per cent of the table honey ever reaches the consumer in the sixty-pound can, and the salvage is almost nothing, it stands to reason that the waste is very great. With the Exchange or other organization placing the honey on the market in small packages, much could be accomplished by having the beekeeper put his honey in drums or durable containers which could be returned to him, or sent to another producer from the central warehouse, thereby using the same container several times during the season. At the same time we would have something that would last for years, and the first cost per pound would not be much different from the present cost of cans and cases.

The market situation is not materially changed, and honey sells very slowly in car lots. The local trade takes the usual amount, and too much can not be said or done in disposing of as much of the crop as possible in the home market.

The bees are wintering only fairly well, and it would be wise to look at all doubtful colonies this month to make sure that all is well within the hive.

Several carloads of bees have already been brought in from Idaho to winter. Each year more beekeepers are doing this. At the same time some get tired of the strenuous efforts of this mode of migratory beekeeping, and decide that they can get enough out of the business by taking good care of the bees in one locality. One of the factors that has entered very largely into the business the past few years is the question of help. This is becoming much improved, as, more and more, the enthusiastic amateur is getting to realize that a year or two spent with a successful apiarist—one that is in the business on a large scale—is time very profitably spent before he invests his hard-earned money in an apiary of his own.

Crop prospects are not very enthusing in southern California. We are considerably short of our last year's rainfall up to Jan. 1. As one man put it, this is a great country to hope in, and we always hope for rain up until June. We base our prospects almost entirely upon the amount of rainfall over the great mountain ranges of these regions, where the sage, wild buckwheat, and so-called wild honeys are produced.

Corona, Calif. L. L. Andrews.

* * *

In Texas.—Weather conditions in Texas are normal. The most of the bees are in excellent condition. More beekeepers than ever before have left plenty of honey in the hives. In the southwest section, where drouth in late summer reduced the honey flow and bees were on starvation rations, they are now in fair condition as late fall rains induced a flow from broomweed, goldenrod, and many of the fall blooming shrubs. The predictions of the older beekeepers that rain any time up to November will insure a horsemint crop certainly appears to be true. Seedling mint plants are everywhere. We still have with us the plague of wood rats and mice, and we can predict with certainty the loss of many colonies unless careful attention is given.

The prospect for spring trade in combless-package bees is beyond expectation. Already many sellers have contracted their entire output. These men must remember that many States into which bees are shipped have quarantine laws and are enforcing them. Texas provides free inspection, and shippers are warned that unless pound-package bees are accompanied by certificates of inspection showing that the bees originated in apiaries free from disease, they will be held up or destroyed by the inspectors of other States when the packages enter States with such regulations.

A very interesting thing is developing in the study of white sweet clover as it grows in Texas. While the plant has been tried only in limited areas, it appears that there is a line running northwest by southeast

FROM NORTH, EAST, WEST AND SOUTH

across the State west and south of which the clover does not thrive owing to the extreme hot dry summers. In northeast Texas this plant is grown for pasture and hay, and is a great addition to the honey flora. As soon, however, as the great plain area is reached white sweet clover seldom lives thru the summer, its blooming period being much reduced.

We have long known of *Apis mellifica* in all of its forms, the East Indian honeybee, the Tiny East Indian honeybee, the Giant bees of India and the stingless bees of tropical America as producers of commercial honey, but we learned only a few days ago that there existed in Mexico and the adjacent parts of the United States quite a trade in ant honey. This honey is obtained from a number of species of ants. In one group called the honey ants, certain individuals act as storage tanks for nectar gathered by the worker ants. This honey is obtained by crushing these ants. We are told that another group of ants store honey in combs, but could find out nothing definite as to just how it is stored. The Mexicans say this honey is better than honeybee honey and largely used in medicines and drinks. Dr. S. A. Rohwer of the National Museum, Washington, D. C., writes us that the Indians of this region have long been users of this ant honey, and that a long account of the use of this honey can be found in ''The Ant Book'' by Wheeler.

The Texas Honey Producers' Association will hold its annual meeting Jan. 18 and 19, 1921, at the headquarters in San Antonio. This has been a prosperous year for the association. In 1920 the capital stock was raised from $15,000 to $65,000 and all the stock sold. At the annual meeting, the election of officers and business sessions will be followed by a social program, including a visit to the new honey packing plant, and some of ''Zims'' stunts. A larger number of members than usual will be present.

Every State likes to brag of its bee locations, but Texas has every reason to be proud of her bee territory. Carrol E. Weber, proprietor of the Hermosa Apiaries in Texas and California, is bringing all his bees to Texas, as he can make more honey here. K. C. Ormand of Pleasanton, Texas, the owner of 400 colonies, got the moving fever. He spent 60 days vsiiting California, Colorado, and other western bee countries, looking for a location. He returned satisfied. He will stay in Texas. H. B. Parks.

College Station, Tex.

* *

In Iowa. — This certainly beats all the Iowa winters I have ever seen, and last December I saw my 48th. The last statement proves that I do not belong to the feminine gender. I am working in the shop with no fire and can keep quite comfortable. There has been scarcely any frost. The grasses are in fine condition. Bees went into winter quarters in good condition with plenty of young bees. In putting combs of honey into colonies that were a little short, it seemed to me that the clusters were exceptionally large. While our fall flow was not up to standard, as we previously mentioned, the bees seemed to breed up for winter normally. During the past two years our fall flow has acted much differently from the usual way, as has also been mentioned by other beekeepers here. Usually the heartsease commences to yield about Sept. 1 and continues until frost kills it. The past two years it began about the middle of August and ceased to yield long before frost. Last year a very unusual circumstance happened. While I was at our district fair with a honey exhibit, during the first of the week I do not think I ever saw the bees bringing in more nectar from the fall flow; but on Wednesday it rained hard and when I arrived home on Friday the bees were trying to rob and the flow was done. This was Sept 10, with no frost for several weeks later. If any beekeeper can explain why this change came so suddenly, I would like to hear it, and also if other beekeepers are having like experiences.

Ye editor, on page 11 of January Gleanings, rather favors the production of comb honey the coming season. I understand the view he takes, and looking at it from one angle it appears like good advice. I am inclined to believe comb honey will be in good demand in 1921, but what price will it bring? If it has to be sold at very much less than it did the past season (and there is every prospect that it will), no beekeeper at the present prices of comb-honey supplies can produce a first-class comb honey and put it out the way the market demands and play even. The demand for comb honey with us this season has been better than for the extracted, while last season it was the reverse. And while we sold for $7.00 and $7.50 per case, we did not consider it was a paying investment, and supplies for comb honey will be higher for the 1921 crop than 1920. If everything keeps going down as it has in the past few months, honey will have to come down along with the rest. There is always a limit to anything. Usually we pay for things very much according to what we are getting for our products. Farmers cannot and will not pay fancy prices for honey when everything they are selling has fallen so greatly in price. Laboring men out of employment (and there will be thousands of them before another year) cannot buy honey at 35c and 50c per pound.

W. S. Pangburn.

Center Junction, Iowa.

FROM NORTH, EAST, WEST AND SOUTH

In Ontario.—Winter temperatures here in Ontario to date (Jan. 10) have been above the average, and so far we have not had a single touch of zero weather. But the winter is still young, and, no doubt, a month from now a different report will be in order. Bees in our York County apiaries have not had a flight since sometime previous to the coming of cold weather, as November was chilly continuously. A few bees were noticed in the air last week one day, but nothing like a cleansing flight was possible. On the other hand, a friend near our Binbrook apiaries south of Hamilton writes me that the bees there have had a fair cleansing flight. Sometimes 25 or 30 miles farther south means just enough difference in temperatures to make it possible for bees to fly in the southern locations while it is too cool here in York County a bit farther north.

Wholesale markets for honey are still draggy, with little prospects of conditions being better in the future as I see it, so far as this season is concerned. Retail prices are staying up quite well, compared with the slump in sugar and many other commodities.

A matter of vital interest to the beekeepers of Ontario is scheduled to come up for discussion at the next annual meeting of the association. During the last five or six years, at least two attempts have been made on the part of a few members to get the association to commit itself to the policy of asking the government to impose a tax of so much per colony on every beekeeper in the Province, the proceeds to be used to pay for inspection work. Different amounts have been mentioned; but, if I remember correctly, the levy advised by the parties behind the movement this year was a minimum of $5.00 for beekeepers with ten colonies or under, and above that number five cents per colony. The matter was brought up at the last hour of the convention after fully two-thirds of the members had left to catch early trains for home. Members opposed to the motion, as well as others not committed one way or the other, argued that the matter was too important to be dealt with under those conditions, and it was voted to carry the resolution over till next year.

Personally, I believe in rendering unto Caesar the things that are Caesar's, but it is a question to me if it is a good policy to run after ''Caesar'' to suggest to him what his dues are. I am opposed to the plan for different reasons. The question of the tax itself is only a secondary one. Probably, if in force, it would hit us as hard as anyone in the Province; but a matter of $60.00 or $70.00 extra would be only incidental among the general expenses and would be met, of course, if called for. But as a matter of principle, I think such legislation would be entirely wrong. We have heard a lot during the past few years on the dignity of beekeeping as a business, what the calling means to other industries when we consider the far-reaching effects of cross-pollination accomplished by the bees, etc. I believe it was R. F. Holtermann who stated at our last convention that for every dollar the beekeeper received for honey, the farmers received another dollar in extra profits from the bees' work in better pollination of certain crops, such as clover, fruits, etc. By asking the Government to take a course that no other industry would think of asking, we would lower the dignity of our profession and virtually admit that the bees are no asset to the country and that we wish to have the country bear with us for the privilege of keeping bees.

Do we find the cattle men asking for a tax to be placed upon every bovine specimen in Ontario to raise a fund for inspection, so as to have tuberculosis, foot-and-mouth disease, blackleg, etc., banished from their herds? Do horsemen ask for a tax on horses for fighting glanders? Or swine-breeders for a tax on their pigs to fight hog cholera? No, in each case the Government believes that these kindred industries are an asset to the country at large, and immense sums are spent each year to fight these diseases, and thousands of dollars are paid out to the owners for diseased stock destroyed—something that is not done in regard to bees destroyed, altho some think it would be fair for the beekeeper to be treated the same as others in that regard. I have before me a clipping from the Toronto Globe of recent date, which states that a herd of cattle (only a few miles from our home) was recently destroyed, as they all reacted to the test for tuberculosis. Sixteen Holsteins valued at $3900.00 were destroyed, and the Government paid the owners two-thirds of the value of the herd. The item further states that Inspector Carey, who was in charge of the work, had paid out $90,000 to farmers for stock destroyed during the last eight months, and that there are nine other inspectors employed at the same work in the Province. In the face of such figures as that, how anyone can advocate going to the Government and asking them to place a tax on us so as to raise a few thousand dollars to have our bees inspected, is a mystery indeed.

British Columbia has a law making it compulsory for all beekeepers in the Province to be registered, a nominal fee being charged each applicant. This is useful for keeping track of all beekeepers for inspection purposes, thus serving a good purpose; and at the same time a number of men are eliminated who do not take enough interest in the business to go to the trouble of registering. J. L. Byer.

Markham, Ont.

HEADS OF GRAIN FROM DIFFERENT FIELDS

Best Time For Arrival of Package Bees. My experience with package bees indicates that under favorable conditions, when received early enough the two-pound packages will produce about as much honey as full colonies wintered over here. But from one-pound packages little surplus can be obtained unless they are helped by a frame of brood, or unless the season is very favorable. Of course much depends on the time of arrival and also on the kind of queen they have. I believe the best time to receive packages here in New York State is about May 10 or between the first and fifteenth of May.

The bees that arrive in the packages are nearly all flying bees. By the fifteenth or twentieth of June very few of the original bees will be left, but the brood that was put in at the beginning will just be bringing forth a new crop of honey producers. You may have observed how the number of flying bees and nurse bees fluctuates every 30 days from the time the bees first begin to breed. As there is time from the fifteenth of May for only one crop of workers before the harvest begins, the time has to be figured out closely. If the bees are received later than this, they may be strong in nurse bees and weak in honey gatherers when the honey flow is on. This often accounts, I believe, for strong colonies being classed as poor honey gatherers when the reason is they were received out of time with the honey flow.

I would urge all who intend to purchase bees in combless packages to get them early if possible. If no surplus is expected, packages received here as late as June 20 will build up into strong colonies by fall, and if there is a late flow of buckwheat or other honey in August they may gather some surplus from it. F. L. Barber.

Lowville, N. Y.

* * *

Queen Not a Suicide. Do Bees Steal Eggs? Two letters in your department of "Heads of Grain from Different Fields" in the December number contain statements which should not go unchallenged.

On page 742 Hafford Jones is perhaps making playful statements, yet he starts out by saying that he positively knows that superseded queens commit suicide. He might as well know that every colony stores 275 pounds because one of his did. Very few queens comparatively do as did his. Most superseded queens stay on the job, if I am to be informed by my own observations. Rarely does a queen act as did this old one. I have seen queens act thus twice, and neither one of them was a supersedure queen. They were sick queens. Workers, also, when sick, will crawl from the hive. Put a sick bee back, and at once it will come crawling out. Why should a sick queen not act like sick workers in this respect? If such statements as Mr. Jones made are to be printed, would it not be well for them to be labeled in such a manner that beginners can know them to be jokes?

On page 744 W. C. Davis says he thinks that he has clear proof that bees steal eggs. I would ask him whether he would want to be hanged on such clear proof as that. Probably he would reply, "I'd be hanged if I would." Mr. Davis has overlooked two very probable and obvious ways in which that egg could be accounted for. His very letter offers the most likely answer. He says that he found three frames full of bees on the old stand. Unfortunately, his letter offers no date, and it is more difficult for me to draw correct deductions as to this statement. Yet three frames full of bees would be rather unusual at any season of the year. From the context I should assume that he moved the hive early in the spring, say in late September or early October in South Africa. At that time with him the north side of the house would be the only side having the sun. At this season the field force would be small, and consequently he would not be likely to get three full frames of bees. It therefore looks as if his hive on the old stand came into possession of a small absconding swarm. The mixed bees were not in a happy state of perfect socialism, so the queen in the stray swarm was not long tolerated. She was allowed to lay one egg before her demise.

It has been my observation many times that old bees furnished with a queen will frequently worry that queen and soon bring about her death, but not before a cell or two have been started to furnish the colony with a queen.

Another explanation is this: Possibly the old bees went back in numbers sufficiently large to cover three combs. For hours that hive was a scene of busy (?) activity. Those bees were crazy for a queen. They were rushing in and out of that hive for a long time. Every little while they set up a loud uproar. At some time while these bees were in this uneasy state a virgin queen out on her wedding trip, or a laying queen of some small absconding swarm, was attracted by the uproar and entered that hive. This is no idle surmise, for I have had it occur more than once. If a virgin and one reared early in the spring, then it might very likely prove very poor and never get beyond the laying of one solitary egg in a queen-cell. (And, by the way, have you not frequently observed that in the case of a young queen eggs appear first in the queen-cups?)

A third possible, tho improbable, expla-

HEADS OF GRAIN FROM DIFFERENT FIELDS

nation is as follows: The moved colony was in the process of superseding its queen. It so happened that the hive was moved at the very moment when the young queen was on her wedding trip. She returned to the old stand with the field bees.

Now as there are two likely ways and one unlikely way in which that egg could be accounted for, I maintain that Mr. Davis has anything but a clear proof that bees steal eggs. Reasoning from an *a priori* premise, I should say that bees never steal eggs. Bees do only such things as instinct tells them to do. They do not reason at all. Their instincts are of long standing and probably have been accumulating for millions of years. If the instinct had been acquired to steal eggs in need, then all queenless colonies would steal eggs when hopelessly queenless. As we know for a certainty that the vast majority of hopelessly queenless colonies die or would die without our assistance, it is obvious that no instinct to steal eggs dwells within the nervous system of the honeybee.

Yours for a logical explanation of all apiarian happenings, Allen Latham.

Norwichtown, Conn.

* * *

Nectar Secretion Affected by Altitude. Under the heading of "Alpine flora" one usually understands the wild vegetation forming a belt of about 3,000 feet just below the limit of the everlasting snow—that is, the plant life growing in the higher regions of the Alps, which stretch from southern France in a southeasterly direction to the Tyrol and Bavaria, crossing Switzerland in two majestic ranges. However, the Alps are not the exclusive habitat of some species which are also to be found in other mountainous regions, as the Pyrenees, Himalayas, Rocky Mountains, etc., which have similar atmospheric conditions.

The chief characteristics of the vegetation of the high region is the comparatively small size of the plant, contrasting with the profusion of flowers, the more vivid colors of the flowers compared with those of the valley, and the more pronounced fragrance. Is it surprising, after all, if we are also told that generally increased secretion of nectar is combined with the properties already mentioned?

The low growth is due to the low night temperature (the time when plants mostly grow) and the very intense sunlight during the day. Experiments have shown that while in Paris only about 68 per cent of the original sunlight reaches the ground, the rest being absorbed by the dense atmosphere, the summits of the Alps get almost a full share —Mont Blanc, for instance, getting 94 per cent.

The foregoing theory is confirmed by the fact that the underground parts—the roots of the Alpine plants—which are protected against light, show a remarkably strong development—more so than the varieties of the plain. Thus the Alpine flowers are true children of the light, but also, at times, they have to struggle against low temperatures, alternating with burning solar heat. The Alpine **Soldanella** is a nice example of a cold-resisting plant, at times pushing the flower buds thru the thin snow cap while the leaves and roots remain still covered by the cold blanket.

As already stated, the intense radiation hinders the growth of the stems and leaves; but, on the other hand, it has a stimulating effect upon the assimilation, and favors the development of flower buds, and hence the profusion of blossoms. The same factor also influences favorably the secretion of nectar. The following statistics prepared in the French Department des Pyrenees, which counts about 20,000 colonies of bees, are quite instructive. The average honey production per colony was as follows:

From sea-level to 1,000 feet, 6 lbs., 10 oz.; from 1,000 to 2,000 feet, 8 lbs. 3 oz.; from 2,000 to 3,000 feet, 11 lbs.; from 3,000 to 4,000 feet, 15 lbs. 7 oz.; from 4,000 to 5,000 feet, 19 lbs. 13 oz.

The above shows a considerable increase in the yield for the higher altitudes. As an example, it may be mentioned here that, while in the low land the spur of the orchis blossom of the white-flowering **Platanthera** is filled only about one-third of its length with nectar, it is more than half full in the higher regions.

Another indirect but very important proof of the higher content of sugar in Alpine plants is found in the fact that their stems and leaves, and frequently also the flowers, are colored red-violet. In some instances, white flowers of the plains become red in the mountains. This has been observed with the common marguerite **(Chrysanthemum leucanteum)**, **Pimpinella magna**, etc. This coloration is attributed by scientists to a substance called "anthocyan." In the Alps the red and violet flowers compose 63 per cent of the whole flora and in the plain only 39 per cent. On the other hand, white-flowering and yellow varieties amount to 33 per cent in the Alps, while the low land counts 55.

Many plants which under ordinary circumstances do not produce anthocyan will do it as soon as their constituent of sugar is increased, for instance, by intense radiation, as always occurs when plants from the valley are transplanted to the Alpine region.

Ernest Tschudin.

Buenos Aires, Argentina, S. A.

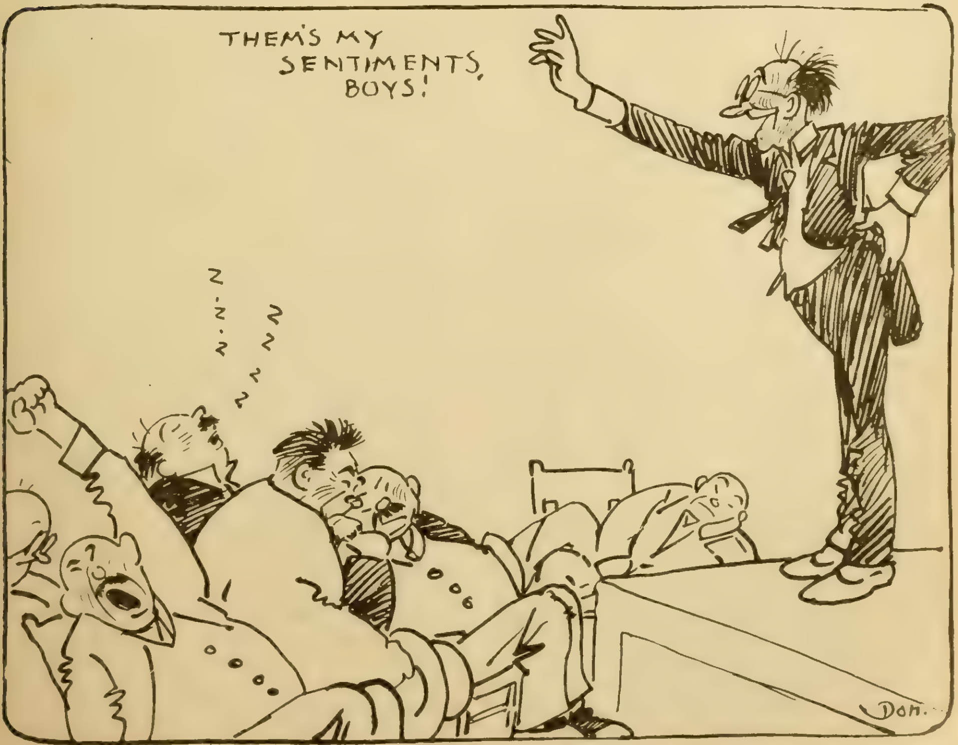
Tin Tube Passageways. We are advised to go around and rake out the dead bees which drop down and clog the entrances. I did a lot of raking last winter and decided that I would try to do away with it this winter. I have entrances from two to six or more inches above the level of the bottom-board, and I am hoping to be able to leave them without attention until spring. These entrances were made with a one-half inch bit, and there is a tin tube which connects with the outer entrance. The hives are well packed with six inches of oat chaff on all sides, four inches on the bottom, and over a foot on top. If it is desired to use the lower entrances during the summer the upper entrances can be easily closed with a stopple. Carl E. Johnson.

Pomfret, Vt.

The Talkfest.—By Bill Mellvir

(With Apologies to Walt Mason.)

Our State Convention was a go, we bee-men lined up in a row and paid our dues with greatest cheer for membership another year. We came from near, we came from far. Such things as distance cannot bar real bee cranks when they want to meet and have a talkfest—what a treat! Now some were great and some were small. Some had ten hives, some none at all. Some knew a little, others none; a few had knowledge by the ton. Old Jimmy Jones from Rocky Dells was there full size and wearing bells. Old Jimmy is a little raw, but he can ply his useful jaw. He talked all day, he talked all night. If others talked they had to fight, for Jimmy always had the floor and belched forth wisdom with a roar. Now Jimmy caught a swarm last year, thus starting on a great career; and now, great whiskers! he can talk, so one can hear him for a block. This trip has cost me many beans, which I dug up from my old jeans; I paid out rubles by the score, and all to hear old Jimmy roar! Bill Jinks sat back within the crowd and never chirped or peeped out loud. Eight hundred colonies has Bill, and yet he sat there calm and still. Now William is a lively one, producing honey by the ton, and he could give us dope so grand if only Jimmy could be canned. As I'm returning to my home, I'm like a bear with festered dome. I paid out cart wheels by the flock, but didn't get to hear Bill talk. Oh, wise and noble president, if you were worth just one red cent, you'd choke off Jimmy on the dot and make him can his tommyrot!



GLEANED BY ASKING

Editors

QUESTION.—I have 27 colonies in the bee cellar under my residence. They are never absolutely quiet, there always being a hum to be heard, but when I listen at the entrance of any single colony I cannot detect any extra activity. Should they be absolutely quiet? The temperature of the cellar is 50 degrees F., and the entrances are ⅞ inch by the full width of the hive. I have a hot-water heater, with two pipes passing thru the bee room, which room is absolutely dry. Just what is meant by quiet? Is it dead quiet or otherwise? Max Tompson.

New York.

Answer.—Bees do not hibernate as do many other insects and therefore do not become absolutely quiet during the winter. Even under the best of conditions there is a slight humming, so that when many colonies are in the cellar, a slight murmur can be detected when entering the room. It would be difficult to say just how much noise is permissible in good wintering, since this must be learned from experience. It is not always possible to maintain the same degree of quiescence year after year in the same cellar on account of the variation in the character of the winter stores if natural stores are used, on account of the variation in the colonies themselves as to numbers and age of the bees, and on account of the variation in the conditions under which they were put in especially with reference to the thoroughness of their cleansing flight just before being put in. As the winter advances cellar-wintered bees usually make more noise, or at least are more easily disturbed by slight disturbances such as light. It may be well for you to experiment with slightly changed temperatures to see at what temperature the bees are most nearly quiet. It may be necessary to lower the temperature a few degrees in February and March to keep the bees as quiet as they are now.

SNOW AND ICE CLOSING ENTRANCE.

Questions.—(1) In the A B C and X Y Z of Bee Culture one is warned (under "Entrances") against leaving a "doorstep" at the entrance of the hive when wintering bees. Just what does this mean? The hive itself has a doorstep or ledge which will catch and hold snow and the hive-stand only adds to its width. How is one to do away with the doorstep? (2) Is there not danger when using small entrances that bees or snow may close the entrance and cut off ventilation. Magdalen Spraull.

New York.

Answers.—(1) When a winter case is used it should be built without a doorstep. Simply bore holes thru the front of the winter case to line up with the tunnel thru the packing. When the Buckeye hive is used the ledge in front of the entrance will catch and hold the snow, but this trouble can be reduced to some extent by tilting the hive forward. Loose snow covering the entrance does no harm; but, if it thaws a little and then freezes, the entrance may be sealed by ice. (2) There is danger that small entrances may be blocked by dead bees or ice under some conditions, and it is sometimes necessary to clean out the dead bees or clear away the ice if the entrances should be closed in this way. If the bees are well protected they will need but little air during the winter; but, if they are not well protected or if for any reason they are not wintering well, they will need much more air. While the entrances might be entirely closed with ice for a short time without harm when the bees are wintering well, it could cause serious trouble under less favorable conditions.

WINTERING WEAK COLONIES.

Question.—I have two colonies of bees that cover about three frames of brood each. I have them inside and would like to winter them in order to save the queens. How can I do this?

New York. Stanley B. Austin.

Answer.—Put these small colonies in the warmest part of the cellar. If you have other colonies in the cellar, the weak ones should be placed on top of the pile of hives near the ceiling. The entrances should be reduced, unless your cellar is warmer than most bee cellars, in order that the small colonies may be able to maintain the necessary cluster temperature. If these colonies had three frames well filled with brood last fall, you should have no trouble wintering them in a good cellar provided they have good winter stores.

HOW TO MAKE HARD CANDY.

Question.—How do you make the candy that you recommend for feeding the bees in winter? I know that some of my colonies are short of stores, and I have no honey to give them. John Rudd.

Minnesota.

Answer.—Into an ordinary kettle of good size pour sugar and water in the proportion of three parts of sugar to one of water by measure. Stir thoroly. For every 20 pounds of sugar put in about one-fourth teaspoonful of tartaric acid. The mixture should be dissolved before applying the heat. Boil for an hour or so. As the white scale or incrustation forms on the inside of the kettle, scrape it down. While it is cooking, tests should be made frequently as follows: Dip up a spoonful of the boiling mixture and slowly pour it back. When it leaves a fine string it is cooked nearly enough. Now, then, from time to time, with the spoon let a stream fall into a cup of cold water. When the boiling has proceeded far enough the string under water will be brittle and crack. Another and a better way to determine when to stop boiling is to use a thermometer and bring the temperature up to 276 degrees F. By that time the water will have been evaporated, when the hot mixture can be poured (never scraping down the sides after beginning to pour) into paper or wooden pie-plates, which must not be disturbed or moved at all till the candy has hardened. Paper pie-plates are just about right, and hold about three pounds. One of these, when cold, can be placed on top of the brood-frames upside down, being sure to place small sticks beneath the inverted plate of candy and so provide a good bee-space between it and the top of the frames.

MOISTURE IN HIVES IN WINTER.

Question.—Will you please tell me why my bees "sweat" during the winter? Jim Knowlden.
Arkansas.

Answer.—This "sweating" is from the moisture given off by the bees, which in the winter time condenses on the cover and sides of the hive, because the walls of the hive are cool enough to cause condensation. For every pound of honey the bees consume they give off nearly two-thirds of a pint of water, which is given off in the form of vapor and remains in the air surrounding the bees in this form until the air is chilled to the "dew-point" when the vapor condenses and becomes visible as small drops of water. Condensation of moisture within the hives can be greatly reduced or entirely prevented by packing the hives well for winter, thus preventing the walls of the hives from becoming cold enough to condense the moisture. In this case, the moisture leaves the hive in the form of vapor thru the entrance or thru the packing and does not condense until the moisture-laden air comes in contact with cooler air or cooler material outside the winter-chamber.

TRANSFERRING FROM BOX HIVES.

Question.—I bought four colonies of bees in old-fashioned hives whose tops are securely nailed down. Would it be practical to bore the top of these hives full of holes and place the new hives with full sheets of foundation on top to transfer the bees? Verlin Hopkins.
Indiana.

Answer.—Yes, you can transfer in this way; but it will be better to tear off the top of the old hives entirely, and also to use at least one empty comb in the new hive instead of only frames of foundation. This one empty comb should be an old brood-comb in which brood has been reared previously. This old comb will be more attractive for the queen and will induce her to enter the new hive and begin to lay there much earlier than when only foundation is used. If the box hive is too tall, the queen may not go into the new hive even when the top is entirely removed, and the colony may become crowded and swarm without beginning work above. In this case, the box hive may be laid on its side, care being taken that the combs are vertical in their new position. The upper side of the hive should then be removed and the open end closed except an opening large enough for an entrance. Now set the new hive on top and close all openings between the two hives with boards or lath. If extracted honey is to be produced, the old hive may be left below until the close of the season, if desired, when it should be free from honey and brood. If comb honey is to be produced the new hive should be set off when the main honey flow begins and placed on the old stand, the old hive being moved to one side of its former location. As soon as the worker brood has all emerged in the old hive, which will be three weeks after the queen went upstairs, the bees may all be driven out of the old hive and united with those in the new hive. To transfer successfully by this method, it is important that the colonies be strong enough previous to the main honey flow to cause them to occupy the new hive before the honey flow actually begins.

TO PREVENT SYRUP FROM GRANULATING.

Questions.—(1) Please tell me what is used to keep sugar syrup from granulating when fed for winter stores? (2) Can bees be fed here in midwinter on sugar syrup? Ed. Busby.
Florida.

Answers.—(1) About a teaspoonful of tartaric acid to every 15 to 20 pounds of sugar used in making the syrup will retard crystallization. The acid should be added while the syrup is hot, since its action on the sugar is more rapid when heat is applied. It is not necessary to use acid except when the syrup is made quite heavy and fed so late that the bees are not able to modify the syrup to any extent as they store it. (2) Yes, bees can be fed sugar syrup in midwinter in Florida or even much farther north, if necessary, if a warm day is selected for the feeding, if the syrup is fed while quite warm, and if the feeder full of warm syrup is placed just above the cluster to induce the bees to take the syrup readily.

FOUL BROOD IN THE SPRING.

Question.—I lost two colonies by American foul brood late in the fall, and have one extra strong colony which made a surplus of 80 pounds last season. How early in the spring may I determine if they also have the disease and how may I tell if disease is present? Lou Kemper.
Indiana.

Answer.—You can tell whether American foul brood is present by examining the brood in April or May. If the colony is still extra strong when the bees begin to work in early spring it will be well to leave them alone until fruit bloom before making an examination, to be sure that no robbing will be started when you open the hive. Look carefully at the cappings of the sealed brood for this disease, and if you notice any that are discolored, sunken, or perforated, open these cells to see if the pupae are dead. By reading carefully the description of the appearance of the dead pupae or larvae in American foul brood as given in the books and bulletins, you can probably tell whether any you find are dead from this cause. As the disease advances, you can see the dried-down scales on the lower side of the cells, by holding the comb in a certain position and looking closely. These scales are the remains of the dead pupae or larvae which are not completely removed by the bees.

JUST NEWS

Editors

THE program of topics for the first annual meeting of the American Honey Producers' League, to be held at the Claypool Hotel, Indianapolis, Ind., on Feb. 15, 16, and 17, is as follows: 2 p. m., Tuesday, Feb. 15—Call to order; Statement of Objects of Meeting, President E. G. Le Stourgeon; Report of Executive Committee; Action on Measures Proposed; Report of Secretary, by Acting Secretary H. B. Parks; Report of Educational Committee, B. F. Kindig; Report of Legislation committee, C. P. Campbell; Report of Markets Committee, Frank Rauchfuss; Report of Legal Aid Committee, O. L. Hershiser; Arbitration Committee, H. B. Parks; Research Committee; Tariff Committee, A. C. Miller; Advertising Committee, Clifford Muth; New Business; "The Stranger Within Our Gates"; Election of Officers; Announcements; Adjournment at 12 o'clock noon, Feb. 17. The schedule of days and hours when these various topics will be discussed has not been given out to date.

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The first of the winter meetings of the Maryland State Beekeepers' Association was held at the Hotel Rennert, Baltimore, Md., on Jan. 8. This association holds monthly meetings during the winter and spring.

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The Eastern New York Beekeepers' Association has incorporated under the laws of the State of New York with a capital of $10,000. The name adopted is The Eastern New York Honey Producers' Co-operative Association, Inc. D. L. Woodward of Clarksville is president of the association.

* * *

The annual meeting of the California State Beekeepers' Association will be held at Oakland March 2, 3, 4, and 5. A fine program is being prepared for this meeting, and a big attendance is expected. On the opening day the Alameda County Association will give a luncheon of 1,000 plates at the Hotel Oakland. This luncheon is given in honor of President Pleasants.

* * *

The annual business meeting of the Ulster County Honey Producers' Co-operative Association was held at the county courthouse, Kingston, N. Y., on Jan. 8. During the afternoon session very interesting and instructive addresses were given by Geo. H. Rea, Extension Specialist in Beekeeping, and W. J. Birdsell. The secretary of this association is Jas. W. Van Gassbeck.

* * *

Lloyd R. Watson, Apicultural Assistant, U. S. Bureau of Entomology, has accepted the position of apiculturist with the Division of Entomology of the Texas Experiment Station, made vacant recently by the resignation of Mr. H. B. Parks. Mr. Parks has accepted a position with the Texas State Honey Producers' Association and is secretary of the National Honey Producers' League.

* * *

The Alameda County Association of California is a wide-awake organization having an official publication of its own, "Bees and Honey," which is published "every little while" by the association. Cary W. Hartman, Oakland, Cal., is the enterprising editor.

* * *

G. H. Cale, Extension Apiculturist of the Division of Bee Culture, Bureau of Entomology, Washington, D. C., has accepted a position with Dadant & Sons, Hamilton, Ill., effective Feb. 1. Mr. Cale was formerly professor of beekeeping in the Maryland Agricultural College.

* * *

The Kansas State Beekeepers' Association will hold its 20th annual meeting Feb. 4-5, 1921, in the rooms of the Chamber of Commerce, Topeka, Kan. The prospect for an increase of apiaries is good. Those interested are requested to attend these meetings. Prominent beemen will be secured to address this meeting.

* * *

A series of beekeepers' meetings in the New England States is scheduled as follows: Providence, R. I., evening of Feb. 7; Boston, Mass., at Horticultural Hall, Feb. 8; Worcester, Mass., evening, Feb. 8; Durham, N. H., Feb. 9; and Storrs, Conn., Feb. 10. Editor Geo. S. Demuth will be one of the speakers at these meetings.

* * *

The program of the short course for beekeepers, to be given by the New York State College of Agriculture in co-operation with the United States Bureau of Entomology at Ithaca, N. Y., Feb. 7 to 12, is received. Dr. E. F. Phillips carries a course of lectures thru the week, and many other noted speakers are scheduled for live topics. New York beekeepers cannot afford to miss this meeting.

* * *

An unusually large proportion of the acreage in the irrigated lands of the Southwest was planted in cotton during 1920, but owing to the present condition of the cotton market the present tendency is to turn this cotton land back to alfalfa. Specialists in the United States Department of Agriculture have pointed out the danger of this resulting in an excessive acreage of alfalfa. Beekeepers of this section will be pleased with this tendency.

BEES, MEN AND THINGS

(You may find it here)

THE season has opened with us. Maple has been in bloom since Jan. 4, and pollen and nectar have both been rolling in. Brood-rearing is well under way. Why not move your bees to a country where there is no winter problem, except plenty of stores. As we get a good fall flow we are not troubled in that respect. Unless we have an unusual cold spell brood-rearing will go forward rapidly. When the poplar and gallberry bloom we will have full hives.''—F. M. Baldwin, Montgomery County, Ga.

''I looked thru a number of colonies last week in the outyards along the Rio Grande River and found one with nine frames containing brood, plenty of flying drones, and about 75 pounds of honey on them. My queens as a rule down there have been laying all winter. We put out queen-cells clear up to Jan. 1 and can start queen-rearing almost any time now. However, will wait until about Feb. 10 to start grafting.''—E. B. Ault, Nueces County, Tex.

''We, the beekeepers of Toowoomba, Queensland, Australia, wish to offer our deep sympathy to the relatives and friends of the late Dr. C. C. Miller, in their sad loss of such a good man. It will be a big loss to the beekeeping world. The beekeepers have lost what might be termed the big three in a very short space of time, Hutchinson, Doolittle, and Miller. Yours in sorrow.'' Walter H. Lincoln, Toowoomba, Queensland, Aus.

''In the January number of Gleanings in Bee Culture, Geo. J. Griesenauer of Cook County, Ills., speaks in regard to the water on the metal tops dropping down in front of the hives. To prevent this I take a ⅞ strip, tack it on inside of the cover and when the cover is in place it slants to the back. All water runs to the back of the hive and drops off.''—H. M. Hodson, Henry County, Ind.

''I think the first thing to consider in preserving hives is to have them made from first-grade lumber, and then paint them with a good grade of paint. As soon as this shows signs of peeling or wearing off, apply another coat. I have some hives that I bought 41 years ago this spring. They have had two or three new bottom-boards during that time. These hives are in first-class condition, and I think they will last as long as I will. There have been several tons of honey taken from them in the last 41 years.''—Geo. W. Baker, Wayne County, Ind.

''About one-half of the bees in Henniker were killed or will die from arsenical poisoning this year. As the bees are killed each year beekeepers are not trying to make up their losses, and the number of colonies is steadily decreasing. The spraying does not seem to accomplish much as the spraying is largely for the gypsy moth, because in order to spray the permission of the owner has to be obtained, and many farmers do not feel that they can give up their pastures at that time, so there are only scattered lots that are sprayed. Different kinds of parasites have been liberated, which feed on the eggs or larvae of the moth.''—S. C. Bennett, Merrimack County, N. H.

''We are having an 'Eat Florida Honey' week here this week. In Tampa alone 87 grocers have honey windows. The newspapers are giving us lots of publicity extolling the virtues of honey as a food with fine results.''—Hafford Jones, Hillsborough County, Fla.

''In my 50 years as a beekeeper I have never seen bees go into winter so heavy as this fall. Other beekeepers like myself expect the extra amount of honey in the hives will be converted into brood next spring and induce swarming. The question is how to get the money to buy supplies if honey and cotton don't move soon. The beemen are in the same condition as the cotton growers with their year's labor and their capital tied up in their crop.''—B. A. Hadsell, Maricopa County, Ariz.

''The Owl Drug Co. is putting out a fine cough syrup using sage honey which we supply them. They say that it is going well and it must be, for they have had close to 1000 pounds of honey for use in compounding same. If you see fit to refer to it in one of the issues of Gleanings, it might stir up some other druggist to undertake a similar production and thus make a market for more honey; and the more we can find a market for, the better for our business.''—H. J. Bostwick, San Francisco, Cal.

''A mean temperature of 41.3 degrees for the month of December, with only a single day that the thermometer touched 31 degrees and then only for two hours, points to an almost needless protection against cold for bees outside here. Daily some activity is noticeable at the hive entrance, and, if for a short time the sun shines, busy workers are bringing in pollen. The source is unknown, altho grounsel, mustard, and other hardy flowers are yet blossoming. When taking off the cover of winter cases and going down to the brood-nest I find no cluster, but bees evenly distributed over all the brood-frames. As usual, the light-colored bees show greater mortality or loss than the darker leather-colored.''—E. J. Ladd, Portland, Ore.

TALKS TO BEGINNERS

By the Editor

MANY beginners in beekeeping have received their inspiration, as well as their start in beekeeping, from a stray swarm that chanced to pass their way as if to dare the uninitiated to attempt to put them into a hive, or perhaps that took up its abode uninvited in some empty box or barrel on the premises, thus thrusting themselves upon the future beekeeper and in many cases changing completely the career of the newly made and involuntary owner of the runaway swarm. By this simple method many of our noted beekeepers, including A. I. Root and the late lamented C. C. Miller, began their beekeeping career.

Beginners might be advised to adopt this method in making a start in beekeeping; but in most cases they would be compelled to wait a long time for the stray swarm to chance their way, and, in addition to this, in many cases the inspiration comes before the bees.

The inspiration may come thru some one of the many subjects which are so closely related to beekeeping, as enumerated by Grace Allen in this issue. For instance, many of the entomologists of this country are enthusiastic beekeepers, their interest in bees coming thru the general subject of entomology. In a few cases only does the inspiration to keep bees come from a desire to make money out of the business, tho it is probably one of the best-paying playthings in the catalog of diversions for tired folks. Most of the successful beekeepers who are making a good living from their bees today began without a thought of financial profit, but because of a keen interest in the subject, tho they may have had in mind from the start the possibility of furnishing the table with just a little "home-grown" honey.

When the inspiration to keep bees does come, it usually comes with a vengeance, and the enthusiasm of the beginner runs high. This impelling enthusiasm is known as the "bee fever," and few who have ever had a real siege of it fully recover.

Books and Bulletins.

This month is a good time to prepare for a beginning in beekeeping in the spring. The very first thing, if not already done, is to procure and read some of the best books on beekeeping, as well as the available bulletins on the various phases of this subject published by the Department of Agriculture at Washington. By writing a postal card to the Bureau of Entomology, Washington, D. C., asking for bulletins on beekeeping applying to your locality, you can obtain free of charge several bulletins properly selected for your needs.

Best Way to Purchase Bees.

The second step is that of arranging to procure the bees and the necessary equipment. The very best way to obtain the bees, where it is possible to do so, is to purchase one or more colonies in well-made modern hives from some neighboring beekeeper. The books and bulletins referred to above contain illustrations and descriptions of the modern beehive, so the beginner should be able to tell if he is buying a standard modern hive from its general structure and appearance. When bees are purchased locally the beekeeper from whom they are purchased can render valuable assistance by preparing the bees for moving.

Judging Condition of Colonies.

It is usually necessary for the beginner to take the word of the one who sells the bees as to the condition of the colonies. The two chief things to look for at this time of year in selecting the colonies are the size of the bee cluster and the amount of honey in the hive. The beekeeper can show the purchaser the size of the cluster by looking in at the top of the hive to see how many spaces the bees occupy; and some idea of the amount of honey in the hive may be obtained by lifting the hives if they are not packed, then lifting an empty hive to note the difference in weight. The cluster should occupy not less than four of the spaces between the combs when the temperature outside is near freezing, and the hive, bees, and honey should be 25 pounds or more heavier than an empty hive at this season.

If colonies of bees in good hives can not be purchased locally, it may be possible to purchase neglected colonies which may be in modern hives but having combs so crooked that they can not be removed without tearing them to pieces, or they may be in boxes or log gums. Usually the job of transferring bees from boxes or gums to modern hives should not be attempted by a beginner until after he has handled bees under more favorable conditions, but the writer has known several beginners whose first experience in handling bees was in transferring. If it is desirable to obtain a lot of experience in a short time this is a good way to do it, but the ordinary beginner will do well to have a more experienced operator do the work while he looks on. A bulletin which tells how to transfer can be had free from the Bureau of Entomology at Washington, D. C. If bees cannot be obtained locally they can be obtained from a distance in full colonies, small colonies (nuclei), or in combless packages. When sold in this way the shipper sends complete directions for taking care of the packages on arrival. The address of reliable dealers who sell bees in this way may be found in the advertising pages of this journal.

OUR HOMES

A. I. ROOT

Remember the sabbath day to keep it holy.—Ex. 20:8.

If thou turn away thy foot from the sabbath, from doing thy pleasure on my holy day, and call the sabbath a delight, the holy of the Lord, honorable, and shalt honor him, not doing thine own ways, nor finding thine own pleasure, nor speaking thine own words, I will cause thee to ride upon the high places of the earth.—ISA. 58:13, 14.

We have made lies our refuge, and under falsehood have we hid ourselves. ISA. 28:15.

YEARS ago when these Home papers were first started in Gleanings, there was some discussion and some criticism in regard to the way I was "mixing religion and business;" but, may the Lord be praised, just now it is nothing particularly strange to see a class journal mix religion and business; and my impression is that the whole wide world begins to recognize that neither business nor religion is injured by combining the two.

This matter was brought to mind by an article in the Manufacturers' Record, of Baltimore, Md., in its issue for May 27. By the way, this magazine, in almost every issue, recognizes the importance of letting our religion show in all our business transactions. Some time ago the Sunday School Times claimed that almost every business house that has stood and flourished for 50 years or more had some God-fearing and church-going man at the head of it. Now for the article in the Record:

MARSHALL FIELD & CO. ON SUNDAY OBSERVANCE AS A FACTOR IN CIVILIZATION.

Marshall Field & Co. of Chicago are probably the greatest merchants in America. Their operations are of vast extent, and for over half a century that concern has ranked as one of the great business leaders of America. By reason of this fact, it is specially interesting to note the position which the company takes in regard to the observance of the Sabbath, believing that in this way they are contributing to the welfare of the world.

Their view on this point was expressed in a letter under date of December 1, 1919, to the editor of the Daily News of Elgin, Ill. A copy of this letter has just come into our possession, and as an interesting presentation of their view of the non-commercialization of Sunday we give it in full, as follows:

"Answering your inquiry of the twenty-fourth ultimo, we will say that during fifty-odd years of business, Marshall Field & Company never have advertised in Sunday newspapers. They have followed the rule that six days for labor and the seventh for rest was best for employer and employe.

"We regard Sunday advertising as an unnecessary infraction of this very wholesome, many-century-old religious dictum, and are glad to follow it.

"We are said to have the most wonderful display windows in the world, covering four sides of a block. The curtains of these windows are lowered from Saturday night until Monday morning, though we have been urged by many people to allow this display to go forward on the Sabbath Day.

"These decisions were made and have been carried out by the founders and owners of this institution, because they have always tried to govern their actions by their interpretation of the effect upon the public morals. As their example is followed by many merchants, they have striven to mold their policies along the highest ethical lines.

"Marshall Field & Co. feel that the fact that they do not commercialize Sunday makes for better citizenship."

If the policy adopted by this firm of not only refusing to advertise in the Sunday papers, but of even lowering the curtains of their great show windows from Saturday night until Monday morning, in order that they might not be an advertisement of the firm, was generally carried into effect, what a marvelous change would take place thruout this country.

The Sunday newspaper is an overgrown production of late years. We believe that in its present size it is a distinct disadvantage to the best interests of the newspapers of the country. If modern conditions demand that the world shall on Sunday have some of the news of the preceding 24 hours, a condensed presentation through a Sunday morning paper would certainly be less objectionable than the stuff which is now furnished in Sunday papers, with their 30 and 40 and 50 and 60 pages of matter. It is very largely to the Sunday paper that the shortage of news paper is due, and we believe that the publishers of the great daily papers of the big cities of the country would be serving their own best interests and the country at large if they would reduce by one-half or two-thirds the size of their Sunday papers. And so far as advertising is concerned, we believe that the statement of Marshall Field & Co. as to their views in regard to the matter will awaken a wide-spread interest among many other business men.

The part that took hold of me particularly was in regard to Sunday papers. Again and again have I decided that I could not afford to waste my time (especially since I am now past 80 years, and my eyesight gives some symptoms of failing) in reading the Sunday dailies or anything of that class. In fact, I made the decision years ago; but every little while something has come up that has caused me to break my promise. (Of course, I made the promise to myself.) When, years ago, I was so much interested in flying-machines (I think it was the time when they had the great World's Fair in St. Louis), somebody sent me a part of a Sunday daily describing at length a new flying-machine on exhibition at the great fair. The whole thing was pictured out with the name and residence of the humble inventor who built it. It performed astonishing feats, and did not cost much over $100. I may not have got my statements just right, as it was so long ago. Well, I was so much interested that I made full investigation. How do you suppose it turned out? No such machine was exhibited at the exposition. No such man invented a flying-machine. It was just a built-up yarn, picture and all. Now just imagine the publishers of a daily paper telling somebody, without any scruples of conscience, to go to work and make a picture and write it all up in order to create an excitement, draw people to the fair, and help the newsboys to sell their papers.

In 1917 one of our good friends, knowing I was a "potato crank," sent me a clipping from a Sunday daily picturing a potato-pen and giving a full description of how a certain man in Kansas City, Mo., grew over 40 bushels of potatoes in a bed about the size of a dining-table. The name and address and full particulars, backed by a circular from a great Coal Co., induced me to investigate. I found the man seemed honest and straight, and I gave the whole thing space in Gleanings—page 559, July, 1917. I did not build a potato-pen; but my next-door neighbor went to considerable expense in building one, and was going to start *two more,* when I succeeded in getting him to hold on. I had enough good sense to refer the matter to Director Thorne of the Ohio Experiment Station, and he declared at once that the whole thing was a fake—an utter impossibility, and I published his letter in connection with the article. The Rural New-Yorker has lately declared that hundreds and maybe a thousand such pens were built all over the country, and not one of them was a success; and that the greater part of them did not give back *as much seed as was planted.*

Occasionally a Sunday daily is deposited on my doorstep; but of late it goes into the waste basket, and I promptly inform the newsman that I have no use for a Sunday daily. My sons and sons-in-law do not quite agree with me—at least not all of them; and occasionally I see my grandchildren wasting their time Sunday mornings in looking at the pictures. I call them low-lived pictures—that is, the average picture in the Sunday daily. Once in a while grandpa is criticised because he does not enjoy jokes. My good friends, you who think so are quite mistaken. I do enjoy a joke as much as any person, I think—that is, where they are harmless jokes and jokes that are likely to do good. One of our Florida papers lately suggested that the California "earthquake bumps" of a recent date were the result of prohibition. Such a joke I greatly enjoy; and I think this particular joke will bear good fruit, because it is just about as reasonable as some of the objections that the wets are bringing forward.

Another Florida paper, in speaking of the wonderful effects of their Florida climate, relates that at a test of athletic strength recently a lively miss of only 94 (?) took the first prize. This test of physical strength was in *climbing trees;* and the 94-year-old woman took the prize against all competitors. Let us now get back once more to the Sunday newspaper.

You all know about the paper shortage; and some valuable rural periodicals, I believe, have ceased publication because they could not get paper. The Record suggests that if our great, heavy, bulky, Sunday dailies could be stopped this one thing alone would effect a great saving in paper. Well, a saving in paper is certainly desirable; but the saving in morals, especially among our children, is of tremendously *greater* importance than the saving of paper. What do you think the impression probably may be on a child twelve years old, when he comes to read about such things as the flying-machine and the potato-pen I have just mentioned? When this child afterwards finds out the truth about it he will begin to suspect untruth in everything.

Now, there is one thing more the Record did not mention; and it is not only the Sunday papers, but the weekly papers that are guilty. Many of our advertisers—especially ungodly advertisers—seem to take it for granted that nobody will look at their advertisement unless there is some display of nude women, or *women's legs,* to put it in plain and square English; and it is not only the advertising pages but the reading pages, for there seems a notion that the paper will not sell unless there is some such immodest display of some good-looking woman. In fact, it has seemed to me that of late they were racking their brains to discover some plausible pretext or excuse for exhibiting nude women. It is right and proper for girls and women to go in bathing in a proper manner as well as for men; but what earthly reason can there be for giving these things place *in print?*

There has been considerable said of late in regard to the lack of attendance at public worship; but our good pastor down in Florida suggested that quite a few professing Christians stayed away because they got interested in the Sunday daily. In regard to the waste of time, I think I have mentioned that Charles M. Sheldon, author of "In His Steps," is now one of the editors of the Christian Herald. In their issue for July 17 he starts what he calls "Helps to Daily Living." I will give you his directions for Monday and Tuesday:

> Monday.—Going to tell the truth and be good-natured all day, and when night comes thank God that I have been able to work and am not a cripple nor an invalid.
>
> Tuesday.—Planning to skip some of the stuff in the papers that is not worth knowing, and find time to read or learn some good thing that I can quote to a friend.

A good many years ago the inimitable Josh Billings asked, "What's the use of knowing so much when so much you know is not true?" I think that will apply most emphatically to what we find in our Sunday dailies. Some of you may say that I am putting it too strong—that notwithstanding the bad which I object to, there is a lot of good in the Sunday daily. But even if this is true, would not the world be better off, all things considered, without any Sunday daily? The clipping I have given from the Record tells us that the Marshall Field Co. is the largest commercial firm in America. Would this have been the case were it not true in regard to their strict ideas of remembering the Sabbath day to keep it holy? I think it must have been something like 70 years ago when my mother taught me a little verse running something like this:

A sabbath well spent brings a week of content,
  With body refreshed for the morrow;
But a sabbath profaned, whatever is gained,
  Is a sure forerunner of sorrow.

Let us consider this matter of the "flying-machine" a little more fully. Suppose the manager or one of the managers of the great World's Fair should look about him and hunt up somebody with sufficient skill, but utterly devoid of conscience, to undertake what he wanted. He might say to him, "You write this thing all up, and then get up in some way the most plausible picture of a flying-machine, no matter whether any part of it was ever in existence or not. It will pull a crowd to the fair and help sell the daily newspapers."

Now, I do not know whether the *editors* of these Sunday papers knew the whole thing was a downright falsehood and fabrication or not; but while thinking the matter over it occurred to me that the grand old prophet Isaiah had something to say somewhere of such people as we have been considering. You will find part of it in our third text. With prohibition and other good things that are coming fast and thick, is it not about time that there must be a sharper distinction drawn between truth and falsehood? For almost if not quite 20 years I fought, and at times almost single-handed, that humbug toy called "Electropoise." After thousands of invalids had wasted their hard earnings our Government finally intervened. The inventors claimed that it was an invention that should be placed alongside of the X-ray and the wireless telegraph. But the whole thing from beginning to end was like the picture of the flying-machine and the potato-pens.

THE NEW SWEET CLOVER AND STABLE MANURE VERSUS CHEMICALS.

Last fall I mentioned making a little bed in our Ohio garden with a heavy dressing of old well-rotted stable manure and a heavy application of lime, both well chopped and raked into our Medina clay soil. Then I sowed the new clover seed. I wanted to see if too much lime would do any harm. It did no harm at all; the plants were up in three days, dark green in color, and grew vigorously until cold weather came. Well, a year ago here in Florida I made a little bed 2½ x 10 feet, and to get good strong plants for transplanting I raked in one-half pailful of potato fertilizer. We can't get stable manure here; no one has any to sell. It killed almost every seed. This winter I tried again, and as goat manure is much used here, I thought surely that would be O. K.; but, "oh, dear me," it killed all the seeds except some at one end of the bed where Wesley probably didn't get so much of the "goat stuff." Not to be bluffed again, I sent Wesley up and down the highway with a great big pail and a little shovel, gathering up the droppings of the mules and horses. It was well pulverized and then raked in a bed of the size mentioned. In 2½ days (only 60 hours) the beautiful dark green little clover plants were in bright evidence all over the bed. Of course we raked in plenty of lime, as I did in Ohio. Well, now comes the question, is the goat manure we got in bags ($2.00 for 100 lbs.) *all* goat manure, or do they put in chemicals or something else (to make it go further"); who can answer? I don't recall ever before having seen seeds of any plant come up in 60 hours.

BURBANK'S EXPERIENCE WITH THE NEW SWEET CLOVER.

Mr. A. I. Root, Bradentown, Fla.

I write to tell you about the annual white clover seed which you sent me. The 45 seeds which you sent produced 42 plants, most of which stand six to seven feet in height and are full of bloom and producing seed abundantly. However, these plants offer a great opportunity for a plant improver, as they vary very greatly in size, and one of them has not even shown a bloom yet, tho all the rest have.

I think you must greatly enjoy your trip overland by automobile to Florida, and most sincerely hope that you will arrive in the best of health and full of life. Here's a handshake from over the mountains. Luther Burbank.

Santa Rosa, Calif., Nov. 4, 1920.

Classified Advertisements

Notices will be inserted in these classified columns for 30c per line. Advertisements intended for this department cannot be less than two lines, and you must say you want your advertisement in the classified column or we will not be responsible for errors. Copy should be received by 15th of preceding month to insure insertion.

REGULAR ADVERTISEMENTS DISCONTINUED IN GOOD STANDING.

(Temporary advertisers and advertisers of small lots, when discontinued, are not here listed. It is only regular advertisers of regular lines who are here listed when their advertisements are discontinued when they are in good standing.)

Noah Bordner, J. F. Moore, Adam Kalb, R. C. Wittman, H. F. Williams, E. L. Lane, W. M. Peacock, Foster Honey & Merc. Co., Chas. Israel Bros. Co., S. Rouse, A. J. Heard, C. H. Cobb, Luther Burbank, Livingston Seed Co.

HONEY AND WAX FOR SALE.

FOR SALE—Clover and buckwheat honey in 60-lb. cans. Bert Smith, Romulus, N. Y.

FANCY clover honey in 60-lb. cans. Sample, 15c. Jas. Hanke, Port Washington, Wisc.

FOR SALE—White clover and basswood blend honey in new 60-lb. cans, two in case. Sample 20c. Geo. M. Sowarby, Cato, N. Y.

BEST offer takes 25 cases, 2 60-lb. tins to case, alfalfa extracted. F. O. B. Manzanola, Colo. Seward P. Stanley.

FOR SALE—Well-ripened, thick and rich white-aster honey in 120-lb. cases at 18c f. o. b. Brooksville, Ky. Sample 25c. H. C. Lee, Brooksville, Ky.

For best table honey try a case of Weaver's sweet clover Spanish needle blend, none better. Price 18c in 60-lb. cans. Joe C. Weaver, Cochrane, Ala.

FOR SALE—2000 lbs. choice clover extracted honey at 20c per lb. f. o. b. Merritt. J. H. Corwin, Merritt, Mich.

FOR SALE—Choice clover extracted honey, $21.50 per case of two 60-lb. cans. For large quantities, write for price. J. D. Beals, Oto, Iowa.

FOR SALE—Finest Michigan basswood and clover honey, well ripened, and of good flavor, put up is 60-lb. cans. A. S. Tedman, Weston, Mich.

FOR SALE—Finest quality extracted buckwheat honey in 60-lb. cans, two in case. Charles Sharp, Romulus, N. Y.

FOR SALE—Clover and buckwheat extracted honey. Well ripened. Put up in new 60-lb. cans and 5 and 10-pound pails. H. B. Gable, Romulus, N. Y.

FOR SALE—Extra choice extracted white clover honey, put up in new 60-lb. cans and 5-lb. pails. Sample, 20c, same to apply on first order. David Running, Filion, Mich.

FOR SALE—Buckwheat-red clover blend honey at 17c a lb. and fine white clover and basswood honey at 22c a lb. in new 60-lb. cans, two to the case, f. o. b. here. Albert Borning, Hayts Corner, N. Y.

HONEY FOR SALE—Immediate N. Y. shipments, clover or sage qualities: White grade at 18c lb. or light amber grades at 16c per lb. Two 60-lb. cans in case. Light amber West Indian grade, 90c per gallon (50-gal bbls.). All f. o. b. New York City. Hoffman & Hauck, Inc., Woodhaven, N. Y.

FOR SALE—1 ton buckwheat-aster honey in 60-lb. cans. What am I offered? 1000 lbs. clover-basswood in 5-lb. pails, $1.50; wholesale, 25c lb. H. S. Ostrander, Mellenville, N. Y.

FOR SALE—White clover honey, almost water white. Put up in new 60-lb. tin cans, two to the case. Write for prices. D. R. Townsend, Northstar, Mich.

FOR SALE—Finest Michigan raspberry, basswood, and clover honey in 60-lb. cans, 20c per pound. Heartsease, aster, 18c. Free sample. W. A. Latshaw Co., Clarion, Mich.

FOR SALE—White honey in 60-lb. cans, sample and price on request. Also white clover comb, 24 sections to case. The A. I. Root Co., Inc., 23 Leonard St., New York City.

Extracted honey. New crop white sage, white orange 20c a lb., L. A. alfalfa 15c, white Haitian 12c, amber 11c, Chilian 10c. Beeswax 30c. Walter C. Morris, 105 Hudson St., New York City.

FOR SALE—10,000 lbs. A1 quality white sweet clover honey, in new 60-lb. cans. Will sell in quantities to suit. Sample free. W. D. Achord, Fitzpatrick, Ala.

FOR SALE—Clover, basswood or buckwheat honey, comb and extracted, by the case, ton, or carload. Let me supply your wants with this fine N. Y. State honey. C. B. Howard, Geneva, N. Y.

FOR SALE—3000 lbs. of well-ripened clover honey at 20c per lb.; 12,000 lbs. of No. 1 white aster honey at 15c per lb., put up in 60-lb. cans f. o. b. Brooksville, Ky. Sample 25c. W. B. Wallin, Brooksville, Ky.

FOR SALE—Well-ripened extracted clover honey, 20c per pound; buckwheat and dark amber, 17c, two 60-lb. cans to case. Clover in 5-lb. pails, $1.25 per pail; buckwheat and amber, $1.00 per pail, packed 12 pails to case, or 30 to 50 pails to barrel. H. G. Quirin, Bellevue, Ohio.

FOR SALE—Clover extracted honey of unsurpassed quality; new cans and cases, prompt shipment. You will be pleased with "Townsend's quality" extracted honey. Not a single pound extracted until long after the flow was over; thus the quality. Would advise intending purchasers to order early, as we have only a half crop. Address with remittance. E. D. Townsend & Sons, Northstar, Mich.

HONEY AND WAX WANTED.

BEESWAX WANTED—For manufacture into SUPERIOR FOUNDATION. (Weed Process.) Superior Honey Co., Ogden, Utah.

WANTED—Bulk comb, section, and extracted honey. Write us what you have and your price. J. E. Harris, Morristown, Tenn.

BEESWAX wanted. Old combs (dry) and cappings for rendering. Also wax accepted in trade. Top market prices offered. A. I. Root Co. of Iowa, Council Bluffs, Iowa.

WANTED—Shipments of old combs and cappings for rendering. We pay the highest cash and trade prices, charging but 5c a pound for wax rendered. The Fred W. Muth Co., Pearl and Walnut Sts., Cincinnati, O.

WANTED—Beeswax. We are paying 1 and 2c extra for choice yellow beeswax, and in exchange for supplies we can offer a still better price. Be sure your shipment bears your name and address, so we can identify it immediately upon arrival, and make prompt remittance. The A. I. Root Co., Medina, Ohio.

OLD COMBS WANTED—Our steam wax-presses will get every ounce of beeswax out of old combs, cappings, or slumgum. Send for our terms and our new 1921 catalog. We will buy your share of the wax for cash or will work it into foundation for you. Dadant & Sons, Hamilton, Illinois.

FOR SALE.

HONEY LABELS—New designs. Catalog free. Eastern Label Co., Clintonville, Conn.

FOR SALE—200 10-fr. comb supers. Good as new. J. A. Everett, Edgewater, Colo.

FOR SALE—A full line of Root's goods at Root's prices. A. L. Healy, Mayaguez, Porto Rico.

ROOT'S goods at Root prices. A. W. Yates, 3 Chapman St., Hartford, Conn.

FOR SALE—One-pound jars in two-dozen cases, ten cases or more at $1.75 per case, f. o. b. factory. A. G. Woodman Co., Grand Rapids, Mich.

FOR SALE—SUPERIOR FOUNDATION, "Best by Test." Let us prove it. Order now.
Superior Honey Co., Ogden, Utah.

ROOT'S BEE SUPPLIES—For the Central Southwest Beekeeper. Beeswax wanted. Free catalog. Stiles Bee Supply Co., Stillwater, Okla.

FOR SALE—Comb foundation which satisfies the most particular beekeeper. Wax worked at lowest rates. E. S. Robinson, Mayville, N. Y.

PUSH-IN-THE-COMB CAGES—Quickest and safest way to introduce queens, 50c postpaid.
F. R. Davis, 203 Oak St., Weehawken, N. J.

FOR SALE—1 saw-mandrel and 2 12-in. saws, cross and rip. New. I will take $12.50. Never been used. Write Guy B. Williamson, Center Junction, Iowa.

FOR SALE—New and used bee supplies at a great bargain, or would exchange for registered hogs, Duroc Jerseys or Poland Chinas.
J. O. Gorman, Glasgow, R. D. No. 4, Ky.

FOR SALE—To reduce stock, crates of 96 one-gallon cans, with bails and three-inch screw caps, at $17.50 per crate f. o. b. Grand Rapids.
A. G. Woodman Co., Grand Rapids, Mich.

FOR SALE or on shares, 14 apiaries, one or all. Healthful location with American school and church in town, on stone road. Last crop over 40 tons. M. C. Engle, Herradura, Cuba.

PORTER BEE ESCAPE save honey, time, and money. Great labor-savers. For sale by all dealers in bee supplies.
R. E. & E. C. Porter, Lewistown, Ills.

FOR SALE—Good second-hand double-deck comb-honey shipping cases for 4¼ x 4¼ x 1⅞ sections, 25c per case, f. o. b., Cincinnati. C. H. W. Weber & Co., 2146 Central Ave., Cincinnati, Ohio.

FOR SALE—50 10-frame supers or brood-chambers and inner covers, 10 comb-honey supers, queen-excluders and Alexander feeders, all for 10-fr. hives. H. Shaffer, 2860 Harrison Ave., Cincinnati, Ohio.

FOR SALE—Root foundation mill 2½ x 6-inch hexagon, thin super, excellent condition, price $40. Also nearly new Newhouse bear-trap, No. 5, $8.00. Edward R. Wilson, Pipersville, R. D. No. 1, Pa.

THE DOMESTIC BEEKEEPER, under new ownership, now reaches every interest, contains exceptionally good articles, timely information, all the news worth printing. Monthly, $1.50 per year. Sample copy for the asking.
The Domestic Beekeeper, Lansing, Mich.

FOR SALE—Good second-hand empty 60-lb. honey cans, two cans to the case, at 60c per case f. o. b. Cincinnati. Terms, cash with order. C. H. W. Weber & Co., 2146 Central Ave., Cincinnati, Ohio.

FOR SALE—8-fr. hives with frame and super, flat cover, $1.00 each, in good condition; some painted, used but little. No disease. Cannot keep so many bees as I did.
Martin Fink, Cold Spring, Minn.

FOR SALE—20 Simplicity hive bodies, painted, some wtih new frames and metal-roof covers and bottom-boards; 11 new Simplicity supers; 27 dovetailed supers. All as good as new. $37.00 takes the lot. F. L. Stearns, No. Bennington, Vt.

FOR SALE—500 pounds of Dadant's light brood foundation for Hoffman frames, put up in boxes holding 50 pounds net. This foundation is in the best of shape, the same as I received it. I will not accept orders for less than one box. Price, 75c per pound. M. E. Eggers, Eau Claire, Wisc.

BEEKEEPERS' SUPPLIES—We manufacture hives, brood frames, etc., and sell a full line of beekeepers' supplies. Everything guaranteed to fit, and anything not satisfactory may be returned. Prices are the lowest. Send a list of your wants. We save you money. M. E. Ballard, Roxbury, N. Y.

FOR SALE—About 12,000 4¼ x 4¼ x 1⅞ dovetailed white poplar sections; lock-corner machine with two sets saws; and lot of bee hive stock suitable for toymakers' use. All at So. Newbury, Vt., and will be sold low to close out.
C. L. C. Davis, 918 Sante Fe, Atchison, Kan.

FOR SALE—50 new two-story ten-frame hives, with metal covers, inner covers, reversible bottoms and full sheets Dadant's medium brood foundation. Hives all nailed. Root make. Foundation not fastened. What do you offer for the whole lot, or any part of same. Address to The Blue-hive Apiaries, Meyer Bros., Prop., Preston, Iowa.

FOR SALE—Eight-frame standard equipment consisting of 40 dovetailed hive bodies at 75c; 30 shallow dovetailed extracting supers, drawn comb, $1.75; 22 reversible bottoms, 60c; 22 excelsior covers, 70c; 17 wood-and-wire excluders, 60c; 9 escape boards (no escapes), 30c, nailed and painted. No disease. Everett P. Bradley, Mt. Holly, N. J.

FOR SALE—250 10-fr. supers, 4¼ x 1⅞ sec., 5 for $6.25; 30 10-fr. supers with sections, 5 for $10.00; 20 8-fr. hives, new frames, 5 for $15.00; 40 8-fr. supers, 4¼ x 1½ sec., 5 for $5.00; 50 Alexander feeders, 10 for $2.50. Above goods all Root make and in excellent condition. Some like new. Ross B. Scott, La Grange, Ind.

FOR SALE—Root's Extractors and Smokers, Dadant's Foundation, and a full line of Lewis' Beeware. Our new price list will interest you. We pay 38c cash, and 40c in trade for clean yellow beeswax delivered in Denver. The Colorado Honey Producers' Association, 1424 Market St., Denver, Colo.

FOR SALE—10 10-frame nailed brood bodies, $10.00 with bottoms; 50 shallow extracting supers, $20.00; 500 shallow frames, part nailed and wired, $22.50; 120 brood frames, nailed, $6.75; 1 four-frame Cowan automatic reversible extractor, $35.00; 100 5-lb. honey pails, $8.00; 20 frames for rearing queens, $1.50; 1 large honey knife, $1.45; $115 takes everything f. o. b. 29 queen-excluders, $14.00. Everything brand-new, except excluders and queen frames. Want a second-hand typewriter.
T. H. Arnold, Brockwayville, Pa.

POULTRY

S. C. Light Brown Leghorn Cockerels, the best show and laying strain, $3.00 and up; also baby chicks. H. M. Moyer, Boyertown, R. D. No. 3, Pa.

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AUTOMOBILE owners should subscribe for the AUTOMOBILE DEALER AND REPAIRER; 150-page illustrated monthly devoted exclusively to the care and repair of the car. The only magazine in the world devoted to the practical side of motoring. The "Trouble Department" contains five pages of numbered questions each month from car owners and repairmen which are answered by experts on gasoline-engine repairs. $1.50 per year. 15 cents per copy. Postals not answered. Charles D. Sherman, 107 Highland Court, Hartford, Conn.

WANTS AND EXCHANGES.

WANTED—Several bee-outfits (preferably near home). H. G. Quirin, Bellevue, Ohio.

WANTED—A good honey location and bee outfit. Delbert Lhommedieu, Colo, Iowa.

WANTED—Second-hand typewriter in good condition. Carl H. Dohrman, Holt, R. D. No. 1, Minn.

WANTED—Second-hand 10-frame empty hives. Will pay cash. Dr. R. B. Smith, Villisca, Iowa.

WANTED—Old combs and cappings for rendering on shares. Our steam equipment secures all the wax. Superior Honey Co., Ogden, Utah.

WANTED—To exchange bees and queens second to none for a 30-30 Winchester repeating rifle, and a novice or other two-frame honey-extractor.
S. Whann, Polk, R. D. No. 2, Pa.

WANTED to buy, or rent for season of 1921, bee-yard in California, near San Jose or San Bernardino Valley preferred. Lloyd Peabody, 300 Globe Bldg., St. Paul, Minn.

WANTED—200 or less colonies of bees for spring delivery. Any style hive or box. Remembering 10c honey is in sight for 1921.
A. W. Smith, Birmingham, Mich.

WANTED—Second-hand Buckeye double-walled hives made by A. I. Root Co., without combs or supers, also Cowan rapid reversible extractor that is in perfect condition.
Chas. C. Mackay, 147 Asheland Ave., Asheville, N. C.

BEES AND QUEENS.

Finest Italian queens. Send for booklet and price list. Jay Smith, R. D. No. 3, Vincennes, Ind.

FOR SALE—Italian queens and nuclei.
B. F. Kindig, E. Lansing, Mich.

Hardy Italian queens, $1.00 each.
W. G. Lauver, Middletown, Pa.

GOLDEN Italian queens, untested, $1.50 each; dozen, $14.00. E. A. Simmons, Greenville, Ala.

FOR SALE—1921 Golden Italian queens, price list free. Write E. E. Lawrence, Doniphan, Mo.

When it's GOLDEN, it's Phelps. C. W. Phelps & Son, 3 Wilcox St., Binghamton, N. Y.

FOR SALE—Bright Italian queens, $1.50 each; $14.00 per doz. Ready after April 15.
T. J. Talley, Greenville, R. D. No. 3, Ala.

FOR SALE—40 colonies for spring delivery as early as weather will permit. No disease.
J. Ford Sempers, Aikin, Md.

FOR SALE—12 standard colonies, painted, wired frames, Root strain, requeened. Good condition. Price in cellar, $10.00 each.
O. C. Bobb, Sinking Springs, Ohio.

PACKAGE BEES and PURE ITALIAN QUEENS. Booking orders now for spring delivery. Circular free.
J. E. Wing, 155 Schiele Ave., San Jose, Calif.

Business-First queens, untested, $1.50 each; select untested, $1.75; tested, $2.25; select tested, $2.50. Safe delivery guaranteed, orders filled promptly.
M. F. Perry, Bradentown, Fla.

FOR SALE—Three-banded Italian queens, untested, $1.50 each; 6, $7.50; 12, $14.00. Select untested, $1.75 each. Satisfaction guaranteed.
W. T. Perdue & Sons, R. D. No. 1, Ft. Deposit, Ala.

PACKAGE BEES and NUCLEI with ITALIAN QUEENS, for spring delivery. No disease in our yards. Write for prices and terms.
The Allenville Apiaries, Allenville, Ala.

FOR SALE—A. I. Root Co. strain of leather colored Italians. Virgins only, May to October. 1, 75c; 10, $7.00; 100, $65.00.
P. W. Stowell, Otsego, Mich.

BEES BY THE POUND — Also QUEENS. Booking orders now. FREE circulars give details. See larger ad elsewhere. Nueces County Apiaries, Calallen, Texas. E. B. Ault, Prop.

Three-banded Golden queens. Quality breeding and mating our motto. Safe arrival guaranteed. Circular free. Dr. White Bee Co., Sandia, Box No. 71, Texas.

GOOD stock, plus experience in shipping bees make it profitable to buy package bees or nuclei. Write for my new circular.
R. V. Stearns, Brady, Texas.

1921 price of bees and queens from the A. 1. Root Co. leather-colored stock. 1 lb. bees with queen, $5.00; 2 lbs. $7.50. Untested queens, $1.50 each; dozen, $15.00. Safe arrival. Orders booked now.
Greenville Bee Co., Greenville, Ala.

We are now booking orders for early spring delivery of two and three frame nuclei, with untested or tested queens. Write for prices and terms. We also manufacture cypress hives and frames.
Sarasota Bee Co., Sarasota, Fla.

FOR SALE—50 colonies Italian bees in 8-frame new hives. On full sheets foundation and wired equipment. All good condition. All goes together for $10.00 per colony. No disease.
Lee Elliott, Greenview, Ills.

FOR SALE—For May and June delivery, 2 lbs. bees and untested Italian queen, shipped on comb of stores at $6.75. Safe arrival and satisfaction guaranteed. No disease. Order now.
Ross B. Scott, La Grange, Ind.

WE believe we have the best Italian queens obtainable. Our new system is working wonders. Book your order now for 1921. Untested, $1.50; tested, $3.00; virgins, imported mothers, 50c.
F. M. Russell, Roxbury, Ohio.

WE wish to thank our many customers for their very liberal patronage the past season and ask them to look in the March number for our 1921 announcement. C. W. Phelps & Son, Binghamton, N. Y., Dealers in Golden Queens.

FOR SALE—Root's strain of golden and leather-colored Italian queens, bees by the pound and nuclei. Untested, $1.50 each; select untested, $2.00; tested, $2.50 each; select tested, $3.00. For larger lots write. Circular free.
A. J. Pinard, 440 N. 6th St., San Jose, Calif.

FOR SALE—Three-band Italian bees and queens, ready June 1. Fine stock, free from disease and guaranteed to please you. (One grade) select untested queens, $1.50 each; 6, $8.00; 12, $15.00; 50, $60.00. Nuclei, $3.00 per frame, Hoffman; bees, $3.00 per pound. A. E. Crandall, Berlin, Conn.

SHE-SUITS-ME queens, season of 1921. Untested Italians, $2.00 each, 10 or more, $1.75 each, from May 15 to June 15. After June 15, $1.50 each, up to nine queens. 10 to 24 queens, $1.40 each. 25 and up, $1.25 each.
Allen Latham, Norwichtown, Conn.

FOR SALE—Three-band leather-colored Italian bees and queens, two-pound packages only. Shipping season from April 15 to May 20. Safe arrival and satisfaction guaranteed. No disease. Order early if you wish prompt delivery. Write for price list.
J. M. Cutts, Montgomery, R. D. No. 1, Ala.

FOR SALE—Bees and queens, 1 lb., $3.00; 2 lbs., $4.50; 3 lbs., $6.00. Tested three-banded Italian queen, $2.00; untested, $1.50. If queens are wanted, add price. Shipment May 10 to June 10. All bees shipped on a standard frame with honey and brood. No disease. All dead bees will be promptly replaced. L. C. Mayeux, Hamburg, La.

WE are now booking orders for 3-lb. packages for May delivery, 3-lb. package with untested queen, $7.00; 3-lb. package with tested queen, $8.00. Orders booked as received. Safe delivery, satisfaction, and no disease guaranteed. All bees shipped on a comb of brood and honey. 50 per cent down will book your order. J. L. St. Romain, White Clover Farm & Apiary, Hamburg, La.

FOR SPRING DELIVERY. One good Italian queen, 1 Hoffman standard frame emerging brood, 1 pound live bees, price complete, $6.50 f. o. b. Bordelonville. Queen introduced, mated, laying en route; loss in transit replaced if noted on express tag by agent; no disease in State. References given. Orders booked, May delivery, one-fifth cash; orders filled in rotation. Jess Dalton, Bordelonville, La.

FOR SALE—Pure Italian queens, Golden or leather-colored, packages and nuclei; 1 untested queen, $1.50; 6, $7.50; 12, $13.50; 50, $55.00; 100, $100; virgins, 50c each; packages 24 and under, $2.25 per pound; 25 and over, $2.00 per pound; nuclei, 1-frame, $4.00; 2-frame, $6.00; 3-frame, $7.50; queens extra. One-story 10-frame colony with queens, $12.00. Golden Star Apiaries, R. 3, Box 166, Chico, Calif.

QUEENS, three-banded Italians only. Now that the booking season for nuclei has passed, and, while I have a large number of orders for nuclei, I shall not be too busy with these to fill your orders for queens. 1 untested for April, $1.25; 12, $12.50; 1 untested for May 1 to June 1, $1.00; 12, $10.00. I ship no queens after June 1; weather is too hot. Discount on large orders. Safe arrival guaranteed.
L. R. Dockery, Carrizo Springs, Texas.

FOR SALE—1921 prices on nuclei and queens. 1-frame nucleus, $3.00; 2- frame nucleus, $5.00; 3-frame nucleus, $6.50, without queens, f. o. b. Macon, Miss. 5 per cent discount in lots of 25 or more. Untested queens, $1.25 each; $15.00 per doz.; tested, $2.00 each; $22.00 per doz. No disease. Inspection certificate with each shipment. Safe arrival and satisfaction guaranteed in U. S. Queens sold only with nuclei.
Geo. A. Hummer & Sons, Prairie Point, Miss.

Vigorous Italian queens, leather-colored, three-banded stock. Bees in packages, 2 pounds, $6.00; 3 pounds, $7.50, queens extra. Price of queens, untested, $2.00; tested, $3.00; full colonies of bees, queens, and brood, in ten-frame standard Langstroth hives supplied with self-spacing frames and combs built on full sheets of comb foundation. $22.00 each. All f. o. b. here. Terms: Deposit of 10 per cent with order, balance payable just prior to shipment. Shipments are made during May, beginning about May 1, depending upon weather and season conditions. I pay cost of shipping cages. My bees are healthy, and I breed from some of the best three-banded stock obtainable. Safe arrival or money returned. References furnished, if required.
C. M. Elfer, St. Rose, La.

DAY-OLD QUEENS—Disease-resistant Italians. Arrival guaranteed in U. S. and Canada. High quality, low price, satisfaction. Safe introduction described in circular. Order early. Prices, April 15 to Sept. 30: 1, 75c; 12, $7.20; 100, $60.
James McKee, Riverside, Calif.

FOR SALE—Golden queens for 1921. Untested queens for delivery from April 20 to July 1, $1.50 each, or 6 for $8.00. For 100 lots write for prices. I guarantee safe arrival and reasonable satisfaction, and all orders and inquiries will be answered promptly. R. O. Cox, Luverne, R. D. No. 4, Ala.

HELP WANTED.

WANTED—An up-to-date beeman for 1921.
R. S. Becktell, Rifle, Colo.

WANTED—A live young man to help me during season of 1921. Allen Latham, Norwichtown, Conn.

WANTED—Beekeeper to work in commercial orchard and to help extract honey. Permanent job and part honey crop. House furnished.
H. W. Funk, Normal, Ills.

WANTED for the season of 1921 an experienced queen-breeder. State experience had, reference, age, height, weight.
W. J. Forehand & Sons, Ft. Deposit, Ala.

WANTED—Two young men of good habits, to work with bees and on farm coming season. Good opportunity to learn. 11 apiaries.
N. L. Stevens, Venice Center, N. Y.

WANTED—Experienced and inexperienced help in large bee business. Begin work about March 1 and continue year around to right parties.
M. E. Ballard, Roxbury, N. Y.

WANTED—First-class county bee inspector, one who knows the business thoroughly. Answer giving particulars of your experience and say what salary you want. Work in California.
C. P. Dandy, El Centro, Calif.

WANTED—Experienced bee man, capable of taking full charge of five apiaries when necessary. Employment six months, chance of right man becoming permanent manager and obtaining interest in business. Write immediately.
Seward P. Stanley, Manzanola, Colo.

WANTED—A willing and reliable, clean young man to assist with bees in outyards. Will give you my experience and wages. State experience you have had, age, weight, height, and wages expected. Board and lodging furnished. Start work about March 1.
A. L. Coggshall, Groton, N. Y.

HELP WANTED—Will give experience and fair wages to active young man not afraid of work, for help in large, well-equipped set of apiaries for season, starting in April. State present occupation, weight, height, age, and beekeeping experience, if any. Morley Pettit, The Pettit Apiaries, Georgetown, Ont.

WANTED—Two young men, able-bodied, willing to work, clean in body and mind, who want to learn beekeeping and are willing to exchange faithful services for instruction from a man with almost 40 years of extensive experience in beekeeping, board and some financial remuneration. Have 12 apiaries. R. F. Holtermann, Brantford, Ont., Can.

WANTED—Capable assistant for system of 8 apiaries and growing sales business. Position open April 1. Opportunity for advancement and permanent position for right party. Man with some experience and knowledge of machinery and automobiles preferred. Wilcox Apiaries, Odessa, N. Y.

SITUATIONS WANTED

WANTED—A position by an experienced apiarist in the southern States. G. F. Dansinger, Olean, N. Y.

SITUATION wanted by experienced bee man. Good references. State conditions in first letter.
Glenn Stonex, Fremont, Mich.

WANTED—Work in apiary in Wayne County, if possible, nine days out of every two weeks. Address Kenneth Sharpe, Wolcott, N. Y.

WANTED—What good proposition have you? I am a middle-aged man with A No. 1 references, expert in beekeeping and general farming, fruit, etc. Employed for the last five years on same place like working manager. I have been working for the best beekeepers in Minnesota. Driving all kinds of cars and for present studying in automotive and tractor school in Los Angeles. If interested, write Stephen Mioch, 1107 W. 41st Pl., Los Angeles, Cal.

Books and Bulletins

Beekeeping in the South.

This is the title of a new book by Kennith Hawkins, published by The American Bee Journal. The book contains 120 pages and is well illustrated. The honey plants of the various regions of the South are discussed, as well as the beekeeping conditions found at present in each of these regions. The book contains valuable information for beekeepers in the southern States as well as for northern beekeepers who contemplate going south to keep bees.

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69 varieties. Also Small Fruits, Trees, etc. Best rooted stock. Genuine, cheap. 2 sample vines mailed for 25c. Descriptive catalog free. **LEWIS ROESCH, Box L, Fredonia, N.Y**

PURE THREE-BAND ITALIAN BEES

Order now for April and May delivery. Untested, $1.25; Select untested, $1.50.

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LARGE, HARDY, PROLIFIC QUEENS

Three-band Italians and Goldens, pure mating and safe arrival guaranteed. We ship only queens that are top-notchers in size, prolificness, and color. Untested, $2.00 each; six for $11.00; twenty-five for $45.00. Tested queens, $3.00 each, six for $16.00.

BUCKEYE BEE CO., Box 443, Massillon, Ohio.

SWEET CLOVER 4^{50} BU.

Unhulled White Blossom Sweet Clover. For winter or early spring sowing. Builds up land rapidly and produces heavy Money Making Crops while doing it. Excellent for pasture and hay. Easy to start. Grows on all soils. Have Hulled Scarified Seed at Low Prices. Sold on a Money Back Guarantee. Write today for Big Seed Guide. **Free.**
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Order your supplies early. Don't *put off* ordering your supplies until your bees swarm. *Do it now!* Always use *Root Quality* supplies. It pays to use the best. Airco Foundation is admittedly better than any other make in the market. Get your bees and queens from us. Information?—We can give it to you on any beekeeping question. Take Gleanings in Bee Culture. You need a bee magazine.

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Queens

Write for our catalog of high-grade Italian Queens. Pure mating and safe arrival guaranteed.

Prices for 1921.

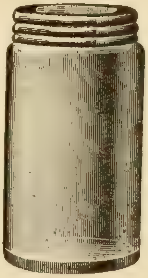
1 to 4 inclusive	$3.00 ea.
5 to 9 inclusive	2.90 ea.
10 or more...	2.80 ea.
Breeders	12.00 ea.

Jay Smith
Route Three
Vincennes, Indiana.

TRADE NOTES

SPECIAL SALE OF HONEY JARS AND TUMBLERS.

16-ounce Round Jar



16-oz. Round Jar

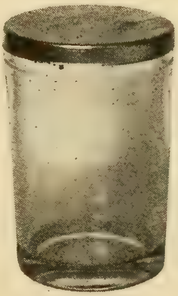
By buying a large quantity of the 16-oz. round jar which we have sold for a good many years and has proved to be so satisfactory, we were able to get a large stock of these, put up two dozen in reshipping cases, from the manufacturers at a very low figure. So long as the present stock lasts we are offering them at the special low price of $1.70 per case, $1.65 per case in lots of 10; $1.60 per case in lots of 25 or more. These prices are f. o. b. Council Bluffs, Iowa. Send all orders direct to the A. I. Root Company, Medina, Ohio.

9-ounce Taper Jar

Since our first notice of having a surplus stock of 9-oz. taper jars packed two dozen in a case, on hand at our Philadelphia Branch, there has been a steady call for them. We are glad to announce that we still have a small stock of this attractive jar on hand to offer at the exceptionally low price of 85c per case, $8.00 for 10 cases, $75.00 for 100 cases. Prices f. o. b. Philadelphia. Send your order direct to The A. I. Root Company, Medina, Ohio.

9-oz. Taper Jar

6½-ounce Tumbler



6½ oz. Tumbler

We have a surplus stock of 6½-oz. tumblers put up two dozen in a case, including tin tops, at our Philadelphia Branch. The cost of these tumblers has more than doubled in the past three years. We offer for a short time the surplus stock, available at 60c per case, $5.50 for 10 cases, $50.00 for 100 cases. Prices f. o. b. Philadelphia. Send your order direct to The A. I. Root Company, Medina, Ohio.

GRASS SEEDS
CLOVERS, TIMOTHY
THE SIGN OF GOOD SEED IS
Bell Brand Grass Seeds are the purest, best quality that can be purchased. Specially adapted to your climatic and soil conditions—hardiness bred into them. The development of 42 years' successful seed culture.

FREE Samples and Catalog
Write for Isbell's 1921 Annual—ask for samples of any field seeds you want. Isbell's "direct from grower" prices assure you of big savings on sterling quality seeds — **"seeds that grow as their fame grows."**
S. M. ISBELL & COMPANY (6)
487 Mechanic St. Jackson, Michigan

Condon's NEW PROSPERITY CABBAGE

Quick as lightning. Hard as stone. One of the earliest in existence. To introduce our **Northern Grown "Sure Crop" Live Seeds** we will mail you 200 seeds of **Condon's New Prosperity Cabbage and our Big 1921 GARDEN and FARM GUIDE** . . . . **FREE**

Send Postal Today for your free copy and Trial Package

CONDON BROS., SEEDSMEN,
Rock River Valley Seed Farm
Box 116 ROCKFORD, ILLINOIS

Best and Newest Fruits

Headquarters for Neverfail, Dunlap, Premier, Oswego, Big Joe, Chesapeake, and 50 other varieties Strawberries; Erskine Park, Plum, Farmer, Idaho, Royal Purple, Columbian, Herbert, and other Raspberries; Snyder, Watt, and other Blackberries; Perfection, Wilder, and other Currants; Doolittle, and other Gooseberries; Grape Vines, Fruit Trees, Asparagus, Seed Potatoes, Roses, Shrubs, Eggs and Baby Chicks, Crates and Baskets, etc. Everything for the Home Grounds. Beautifully illustrated and instructive catalogue free.

L. J. FARMER, Box 108, Pulaski, N.Y.

Thrifty, Sturdy Trees

You can be sure when you buy Woodlawn grown fruit trees, vines and berry bushes that they are thrifty, vigorous growers and heavy bearers. Our 45 years of successful growing experience has been directed towards producing a wide variety of that kind of stock. We have the exclusive sale of the new Ohio Beauty Apple.

Our extensive line of ornamental shrubs, bushes, and perennials are of the same dependable quality as our trees.

We sell seeds for the vegetable and flower garden. Illustrated 1921 Nursery List contains valuable planting and growing information. Mailed on request.

New Ohio Beauty Apple

WOODLAWN NURSERIES
882 Garson Ave. Rochester, N. Y.

GRASS SEED

FREE SAMPLES **Wonderful Value Wholesale Prices Highest Quality**

Don't fail to investigate these bargains. Recleaned Tested Timothy **$3.95** bu. Sweet Clover unhulled, **$4.50** bu. Alsike Clover & Timothy **$5.85** bu. Sudan Grass **81-2c** lb. Prices cover some grades of limited quantities. Clover and other Grass & Field Seeds at low prices. All sold subject to State or Government Test under an absolute **money-back guarantee.** We specialize in grass and field seeds. Located to save you money and give quick service. We expect higher prices-Buy now and save big money. Send today for our money-saving Seed Guide, explains all-**free.**

American Mutual Seed Co. Dept. 651 **Chicago, Ill**

ROSES

of New Castle

Are the hardiest, fresh blooming rose plants in America Grown on their own roots in the fertile soil of New Castle We give you the benefit of a life time experience and the most select list in America. Every desirable Rose now cultivated in America is included in our immense stock—and the prices are right.

Our rose book for 1921 ROSES OF NEW CASTLE tells you how to make rose growing a success. Published and elaborately printed in actual colors. Send for your copy today—a postal will do.

HELLER BROS. CO., Box 218, New Castle, Ind.

PROGRESS TREES and PLANTS GROW

because they are propagated right, dug carefully, and packed securely. Write for our Catalog and NO-RISK offer of trees, shrubs and plants. We pay express charges. Why pay for your trees before you get them? It's not necessary if you deal with **THE PROGRESS NURSERY COMPANY,**
1317 Peters Avenue Troy, Ohio

The "BEST" LIGHT

Positively the cheapest and strongest light on earth Used in every country on the globe Makes and burns its own gas Casts no shadows. Clean and odorless Absolutely safe Over 200 styles 300 to 2000 Candle Power Fully Guaranteed Write for catalog AGENTS WANTED EVERYWHERE

THE BEST LIGHT CO.
306 E. 5th St., Canton, O.

GOOD SEEDS

Grown From Select Stock —NONE BETTER—50 years selling seeds. Prices below all others. Buy and test. If not O. K. return and I will refund. Extra packets sent free in all orders I fill. Send address for **BIG CATALOGUE,** illustrated with over 700 pictures of vegetables and flowers of every variety.

R. H. SHUMWAY,
ROCKFORD, ILL.

Record Garden Yields

Plant Northern Grown Seeds

Assure yourself of the biggest yields — the best your garden can grow. Use the Isbell Catalog as your guide. It shows varieties almost unlimited of the finest vegetables, many prize winners of international reputation—all produced from

NORTHERN GROWN

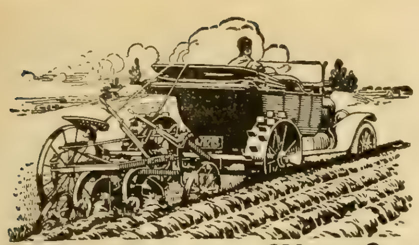
Isbell's Seeds
"As They Grow Their Fame Grows"
TRADE MARK

Plant only the best, hardiest, earliest maturing seeds. Our 42 years' growing seeds in Michigan—ceaseless experimenting, careful selection, and perfect cleaning have made more than 200,000 satisfied Isbell customers. You buy direct from the grower and save money. Satisfaction guaranteed.

FREE 1921 Catalog

Write today—get the 1921 Isbell seed book. It's a valuable guide for growing great crops. Gives complete cultural directions. Post card brings it **Free.**

S. M. ISBELL & COMPANY (3)
486 Mechanic St. Jackson, Michigan



Make a Tractor of Your Car

Use it for farm work. Pullford catalog shows how to make a practical tractor out of Ford and other cars.

Write for Catalog

Pullford Co., Box 23 C Quincy, Ill.

VICK'S GARDEN & FLORAL GUIDE for 1921

IT'S FREE **A WORTH WHILE BOOK** *WRITE TODAY*

For vegetable growers and all lovers of flowers. Lists the old stand-bys; tells of many new varieties. Valuable instructions on planting and care. Get the benefit of the experience of the oldest catalog seed house and largest growers of Asters in America. For 72 years the leading authority on vegetable, flower and farm seeds, plants, bulbs, and fruits. 12 greenhouses. 500 acres.

Vick Quality Seeds Grow the Best Crops the Earth Produces

This book, the best we have issued, is *absolutely free. Send for your copy today before you forget. A postcard is sufficient.*

JAMES VICK'S SONS, 33 Stone St.
Rochester, N.Y. *The Flower City*

World's Best Roofing at Factory Prices

"Reo" Cluster Metal Shingles, V-Crimp, Corrugated, Standing Seam, Painted or Galvanized Roofings, Sidings, Wallboard, Paints, etc., direct to you at Rock-Bottom Factory Prices. Positively greatest offer ever made.

Edwards "Reo" Metal Shingles

cost less; outlast three ordinary roofs. No painting or repairs. Guaranteed rot, fire, rust, lightning proof.

Free Roofing Book

Get our wonderfully low prices and free samples. We sell direct to you and save you all in-between dealer's profits. Ask for Book No. 283

LOW PRICED GARAGES

Lowest prices on Ready-Made Fire-Proof Steel Garages. Set up any place. Send postal for Garage Book, showing styles.

THE EDWARDS MFG. CO.,
233-283 Pike St., Cincinnati, O.

FREE Samples & Roofing Book

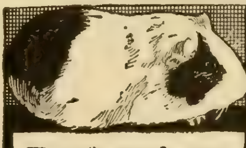
12 Months to Pay

Enjoy your **1921 "Ranger"** at once. Earn money for the small monthly payments on **Our Easy Payment Plan.** Parents often advance first small payment to help their boys along. **FACTORY TO RIDER** wholesale prices. Three big model factories. **44 Styles,** colors and sizes in our famous Ranger line. **DELIVERED FREE,** *express prepaid,* **FOR 30 DAYS TRIAL.** Select bicycle and terms that suit—cash or easy payments.

Tires lamps, horns, wheels, parts and equipment, at half retail prices.

SEND NO MONEY — Simply write today for big **FREE** Ranger Catalog and marvelous prices and terms.

Mead Cycle Company Dept. F 153 **Chicago** Special Offer to Rider Agents

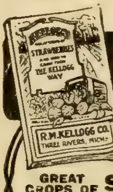


Raise Guinea PIGS FOR US!

We need men and women, boys and girls everywhere to raise Guinea Pigs for us. We tell you where to get them, show you how and buy all you raise. Big opportunity for money making. Thousands needed weekly.

Easy to Raise—Big Demand No special knowledge, **Large Profits** experience or equipment needed. They breed the year round—are very prolific—require but little space or attention. Pay better than poultry or squabs—cost less to house, feed, keep, easier raised—less trouble, market guaranteed. **FREE** Particulars, contract, and booklet how to raise

CAVIES DISTRIBUTING COMPANY
3145 Grand Avenue, Kansas City, Mo.
Largest Guinea Pig breeders and distributors in America.



WE WANT TO SEND YOU THIS VALUABLE 1921 STRAWBERRY BOOK

FREE and POSTPAID

KELLOGG'S GREAT CROPS OF STRAWBERRIES AND HOW TO GROW THEM

Beautifully illustrated and full of valuable strawberry information. Tells all about the world's leading strawberries—the world-famed **KELLOGG STRAWBERRY GARDENS** and explains how Kellogg's FREE Service helps beginners succeed right from the start. Send your name and address today for this book. It's FREE and POSTPAID.

R. M. KELLOGG COMPANY
Box 303
Three Rivers, Michigan

(3)

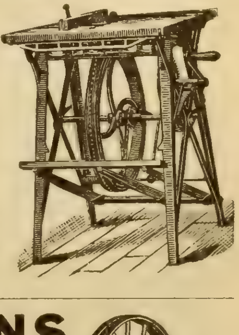
BARNES'
Hand and Foot Power Machinery

This cut represents our combined circular saw, which is made for beekeepers' use in the construction of their hives, sections, etc.

Machines on Trial

Send for illustrated catalog and prices.

W. F. & JOHN BARNES CO
546 Ruby Street
ROCKFORD, ILLINOIS

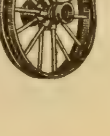


Write for Book Today

FARM WAGONS

High or low wheels—steel or wood—wide or narrow tires. Steel or wood wheels to fit any running gear. Wagon parts of all kinds. Write today for free catalog illustrated in colors.

ELECTRIC WHEEL CO., 23 Elm Street, Quincy, Ill.



EVERGREENS Hill's Hardy Tested Varieties
Fine for windbreaks, hedges and lawn planting. All hardy, vigorous and well rooted. We ship everywhere. Write for free Evergreen book. Beautiful Evergreen Trees at moderate prices. D. Hill Nursery Co., Box 246, Dundee, Ill.

450,000 TREES
200 varieties. Also Grapes, Small Fruits, etc. Best rooted stock. Genuine, cheap. 2 sample grapes mailed for 25c. Catalog free. LEWIS ROESCH, Box L, Fredonia, N.Y.

INDIANOLA APIARY

will furnish 3-banded Italian bees and queens: Untested queens, $1.00 each; tested, $1.50 each. One pound bees, no queen, $2.00. No disease.

J.W.SHERMAN,VALDOSTA,GA.

ROOT'S BEE SUPPLIES.

I can make immediate shipment for early orders, and you can get the discount by ordering early.

A. M. MOORE, Zanesville, Ohio.
22½ South 3rd St.

BEE SUPPLIES

We are prepared to give you value for your money. Our factory is well equipped with the best machinery to manufacture the very best bee supplies that money can buy. Only the choicest material suitable for beehives is used. Our workmanship is the very best. Get our prices and save money.

EGGERS BEE SUPPLY MFG. COMPANY, INC.
Eau Claire, Wis.

LISTEN BEEKEEPERS

We wish to tell the readers of Gleanings that the Bank of Perris has taken over about 500 hives of bees which we wish to sell as follows:

Nuclei Will Be Our Specialty.

One frame with queens, $3.00; 2 frames and queen, $5.00; one pound with queen, $2.50; 2 pounds and queen, $4.00; 8-frame Single-story colonies, $10.00, F. O. B. Perris.

Young laying queens, $1.50 each; $8.00 for 6; $15.00 per dozen; 50 to 100 or more, $1.00 each.

We have a man in charge with long experience in bee-shipping. Let us book your orders with 10 per cent with same, balance when bees are wanted. Ask for special prices on large order. Shipping season begins May 10th. Safe arrival and satisfaction.

Address
BANK OF PERRIS
PERRIS, CALIF.

BANKING BY MAIL AT 4%

SEND IT BY MAIL
When you get a little surplus money, do not hide it in your house where it is in danger of loss by fire or theft, but send it at once by mail to this old, unquestionably safe bank, where it will earn 4 per cent interest.
Your account, in any amount, is cordially invited.

THE SAVINGS DEPOSIT BANK Co.
A.T.SPITZER, Pres.
E.R.ROOT, Vice Pres. E.B.SPITZER, Cash.
MEDINA, OHIO

TINS AND GLASS JARS Down in Cost---Order Now for Next Crop Packing. Note Low Prices Subject to Change at Any Date

Following Tins F. O. B. Baltimore Factory. For New York Shipment add 15 per cent extra.

2½-lb. Cans, 2 doz. reshpg. cases	$1.45 per case net
2½-lb. Cans in 100-can crates	$6.50 per crate net
2½-lb. Cans in 200-can crates	$11.00 per crate net
2½-lb. Cans in 500-can crates	$24.50 per crate net
5-lb. Pails with Handles:	
1 Doz. reshpg. cases	$1.35 per case net
In Crates of 100	$8.30 per crate net
In Crates of 200	$16.25 per crate net
10-lb. Pails with Handles.	
In ½ Doz. cases	$1.10 per case net
In crates of 50	$6.70 per crate net
In crates of 100	$12.75 per crate net
5-Gal. tins, used, good condition, 2 to case	50c per case
5-Gal. tins, NEW, 2 tins to wood case	$1.35 per case

WHITE FLINT GLASS, WITH GOLD LACQD. WAX-LINED CAPS.
F. O. B. Wheeling, W. Va., Fcty., or add 15 per cent for New York City Delivery.

8-oz. Honey Capacity, Cylinder style	$1.50 carton of 3 doz.
16-oz. Honey Capacity, Table Jar style	$1.40 carton of 2 doz.
Quart or 3-lb. Honey Capacity, Mason Style	$1.00 carton of 1 doz.

HOFFMAN & HAUCK, INC. - - Woodhaven, New York

FOREHAND'S QUEENS---THEY SATISFY, WHY?

Because of 28 years of experimental work, with both queen-breeding and honey-production. With breeding and selecting of imported queens, I have reached a standard which is ideal. Queens as good, but none BETTER. Why experiment? Take advantage of the life experience of my breeders. OUR SERVICE STATION.—We are ready to serve you at all times, whether you desire queens or advice. Let us help you with your bee problems. All questions are cheerfully answered.

I breed three-banded Italians only. Nov. 1st to June 1st.

	1	6	12
Untested	$2.00	$9.00	$16.00
Selected Untested	2.25	10.50	18.00
Tested	3.00	16.50	30.00
Selected Tested	3.50	19.50	36.00

Orders booked now for spring delivery. One-fourth the full amount with order and balance when shipment is desired. Pure mating, safe arrival, and perfect satisfaction guaranteed. Write for circular and large-order discounts. Foreign orders at receiver's risk.

N. FOREHAND - - - - RAMER, ALABAMA

THE OLD RELIABLE
THREE-BANDED ITALIANS

Booking orders now for 1921. Queens ready April 1st. My Italians are of an exceptionally vigorous and long-lived stock strain of bees. They are gentle, prolific, very resistant to foul brood, and the best of honey-gatherers. I have sold a good many queens to parties who are using them in stamping out foul brood. Orders booked for one-fourth cash, balance before delivery. Will guarantee safe arrival in the United States and Canada. Descriptive circular and price list free.

	Prices April, May, and June			July to November		
	1	6	12	1	6	12
Untested	$1.50	$8.00	$15.00	$1.25	$6.50	$12.50
Select Untested	1.75	9.00	16.00	1.50	8.00	15.00
Tested	2.50	12.50	24.00	2.25	12.00	22.00
Select Tested	3.00 each			3.00 each		

No nuclei or pound packages of bees for sale.

John G. Miller, 723 C St., Corpus Christi, Tex.

HONEY-BROOK FARM

TWO & THREE LB. PACKAGES ITALIAN BEES —ALSO THREE-BANDED ITALIAN QUEENS—Delivered to you by parcel post. My bees are untiring workers—gentle, prolific, properly priced. Pure mating absolutely guaranteed. Ready for shipping April 10. To be in line let me book your order now. Only ten per cent cash required with order, balance just before you desire shipment. No package bees sent without a queen.

Prices: Two-pound packages, including untested queen, $6.50. Three-pound package, including untested queen, $9.00. Twelve or more packages, 25c per package less. Queens: Untested, $1.50 each, or $15 per dozen. Tested, $2.00 each straight. I will pay all postage on package bees and queens. Empty cages to remain my property and to be returned at my expense. Prompt service, safe arrival and satisfaction guaranteed.

JASPER KNIGHT, PROP. HAYNEVILLE, ALA.

Quality Bee Supplies
From a Reliable House

¶ Without fear or favor I place my BEE SUPPLIES and SERVICE before you.

¶ It is the small annoyances that often grow into disastrous results. Avoid the so-called ''little losses'' by using MONDENG'S goods. Quality is first—save time when you put your goods together by getting supplies that are accurately made. Service is next—no delays when bee supplies are ordered from my factory.

¶ I am ready to meet your urgent needs. Send for my latest price-list.

¶ Closing out all Langstroth and Wisconsin hives and supers. Also Langstroth triangular top-bar frames, and eight-frame D. T. supers for 4 x 5 sections. At cost price, write for quotations.

Charles Mondeng
146 Newton Ave. N. &
159 Cedar Lake Road.
MINNEAPOLIS, MINNESOTA.

Beeswax Wanted

In big and small shipments, to keep Buck's Weed-process foundation factory going. We have greatly increased the capacity of our plant. We are paying higher prices than ever for wax. We work wax for cash or on shares.

Root Bee Supplies

Big stock, wholesale and retail. Big catalog free.

Carl F. Buck
The Comb-foundation Specialist
August, Kansas
Established 1899.

Thagard Italian
Queens
Bred For Quality

Booking orders now, ¼ cash with order; balance just before queens are shipped.

	April 1st to July 1st 1	6	12
Untested	$2.00	$8.00	$15.00
Select Untested	2.25	10.00	18.00
Tested	3.00	16.00	28.00

Special prices on 8-10 frame Root Hives of bees, in lots of 10 to 50.

Safe arrival, pure mating, and satisfaction guaranteed. Circular free.

V. R. Thagard
Greenville, Ala.

Results Are
What Count

The careful beekeeper buys supplies which will produce the desired results at the lowest cost. That is why so many beekeepers are ordering my comb foundation for next season's use. They have found from previous trial that my foundation produces perfect combs at the least expense. Here is what one customer writes after a season's trial:

"You may be interested in my opinion of your foundation.

"I have tested out your foundation, together with several others, as to its uniformity of manufacture, and its adoption by the bees, etc. I did this for my own benefit, as a guide for my future buying. As to adoption by the bees, I find no difference in any make of same grade and age.

"I found your foundation very uniform in quality and trim, your mode of packing as good as any, and with me you have always been as prompt in shipping as the promptest. Then why should I pay any manufacturer more than what you charge? Yours respectfully,
J. C. Brasser, Lewiston, N. Y."

Your own wax worked into foundation at lowest rates. Send for price list.

E. S. Robinson
Mayville, Chau. Co., N. Y.

Our Food Page—Continued from page 93.

altho it is quite difficult to handle with dough as soft as biscuit dough.

FRUIT ROLLS

Make the rolls as in the preceding recipe, but in place of the cinnamon and sugar use chopped dried fruits such as raisins, currants, figs, dates, or a mixture of two or more of them.

SHORTCAKE

Use the standard recipe, increasing the amount of shortening if a rich crust is desired. Roll out half an inch thick, cut the size of a layer cake pan, spread with softened butter, put another round on this, spread with cream and bake in a hot oven. When done, split, spread with the crushed and sweetened fruit, put the other layer on top, spread more fruit on this, and serve at once. Or the shortcake may be baked as individual biscuits, split and spread with the fruit. Instead of fruit the biscuits may be split, buttered, spread with creamy granulated honey, and served with whipped cream, if desired.

FRUIT PUDDING

Put the desired amount of canned or fresh fruits in an earthen or glass baking dish, put drop biscuits closely over it, and bake until the biscuits are done and lightly browned. Serve with butter or cream or a hard sauce if the fruit is not sweet enough. If slow-cooking apples are used it is well to put them in the baking dish, cover closely, and bake until partially done before putting on the crust.

BAKED FRUIT DUMPLINGS

Use the standard recipe for cut biscuits, but double the amount of shortening, roll out in a thin sheet, cut in 4-inch squares, put several pieces of drained fruit in the center of each, fold and pinch the corners together and arrange in an oiled baking pan, pour the sweetened fruit juice around them, and bake until lightly browned. If the juice cooks away add a little hot water. There will usually be enough juice for a sauce. This is delicious with stoned prunes, especially when a slice of orange has been cooked with the prunes. Apricots or dried or canned peaches are also very good. Quick-cooking applies may be used with sweet cider which has been additionally sweetened poured around the dumplings.

STEAMED FRUIT DUMPLINGS

Follow the standard biscuit recipe, using only half the amount of shortening, make dumplings as in the preceding recipe, arrange in an oiled pan without the fruit juice, and steam about an hour.

PLAIN DUMPLINGS

Follow the recipe for cut biscuits, omitting half the shortening, or a very good dumpling may be made without any shortening. They may be rolled and cut or dropped from the tip of a teaspoon on the boiling hot stew, covered closely and cooked ten minutes. Serve on a platter with the meat and gravy dipped over them. Or if they are cooked on the top of stewed fruit, serve on individual dessert plates with the sweetened fruit, to which a little butter has been added, poured over them as a sauce.

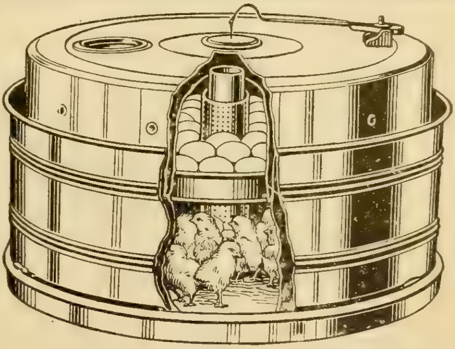
ROLY POLY PUDDING

Follow the recipe for cut biscuits, omitting half the shortening, roll out ¼ inch thick, spread with jam, roll up, pinch the ends together, place on a greased pan, and steam about an hour. If it is desired to bake it, more shortening should be used.

MEAT PIE

Arrange cooked meat in a baking dish, cover with thickened stock or gravy, place in oven until heated thru, drop biscuits closely over it, leaving a steam vent in the center, and bake until the biscuits are done and delicately browned. Cut biscuits may be used, if preferred. This is a good way to use left-over bits of meat. Potatoes and onions may be mixed with the meat, if desired, making it a one-dish meal with the addition of fruit or a salad.

All measurements level and flour sifted once before measuring.



It's Easy to Raise Poultry With Cycle Brooder-Hatchers.

A NEW idea, combining both Brooder and Hatcher in one machine, one lamp serving both purposes. A real "Metal Mother" that will hatch every hatchable egg, and the chicks will be strong, lively, and easy to raise in the brooder compartment.

YOU can use the Cycle either as a Brooder or Hatcher, or *both at once*. The Cycle is all metal; you can operate it safely in the house or in any outbuilding. You can see the eggs at all times through the round glass window without lifting the top. And you can turn them instantly with a single movement. The regulator control is very sensitive. A gallon of kerosene will usually carry through an entire hatching.

Just the thing for busy farmers and city enthusiasts. 50-egg and 50-chick size $11.00. Two for $20.00.

THE CYCLE HATCHER: Exactly the same as the Brooder-Hatcher, *but without the brooding compartment*. 50-egg size $9.00. Two for $17.00.

WEIGHT: 18 lbs. for parcel post shipment. Postage extra.

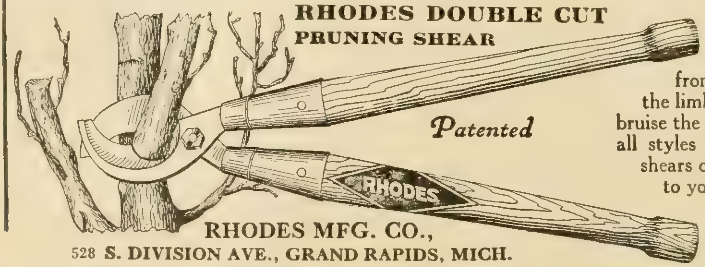
CATALOGUE of Hatchers, Brooders, Poultry and Supplies sent free. Send a postal today.

CYCLE HATCHER COMPANY
240 Philo Bldg., Elmira, N. Y.

QUEENS---GOLDEN OR THREE-BANDED

Until July 15 I will furnish untested Italian Queens at the following prices: One, $1.50; six, $8.00; dozen, $15.00. Safe arrival and satisfaction guaranteed. I do not ship any queens that are inferior in size, color, or prolificness. Mating yards four miles apart. (See classified adv. for package bees.)

Ross B. Scott, La Grange, Ind.



RHODES DOUBLE CUT PRUNING SHEAR

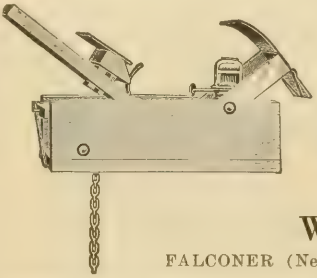
Patented

THE only pruner made that cuts from both sides of the limb and does not bruise the bark. Made in all styles and sizes. All shears delivered free to your door. Write for circular and prices.

RHODES MFG. CO.,
528 S. DIVISION AVE., GRAND RAPIDS, MICH.

EARLY ORDERS BRING SAVINGS

NATURALLY we want your order for bee supplies NOW, when we can give it better attention. Spring will soon be here, with its usual rush for supplies. So we offer an early-order discount to beekeepeers who buy NOW. **Write today for our red catalog.**



We are exclusive manufacturers of the DEWEY FOUNDATION FASTENER.

Many exacting beemen claim it is the best machine yet devised. Overcomes objections common to all others. Include the DEWEY in your order.

W. T. FALCONER MFG. CO.

FALCONER (Near Jamestown), N. Y. *"Where the best beehives come from."*

Honey Producers, Take Notice

Do you realize it is only a short time until your bees will be taken out of winter quarters? Have you thought about supplies for next season? Do not wait until swarming time for that means dollars out of your pocket. Order your supplies NOW.

We manufacture and carry in stock a complete line of Bee Supplies ready for prompt shipment. Send us a list of the supplies you wish to purchase and we will be pleased to quote you our prices. Our 1921 descriptive catalog and price list is now ready for mailing. Send us your name and address and we will mail it to you.

August Lotz Company, Boyd, Wisconsin

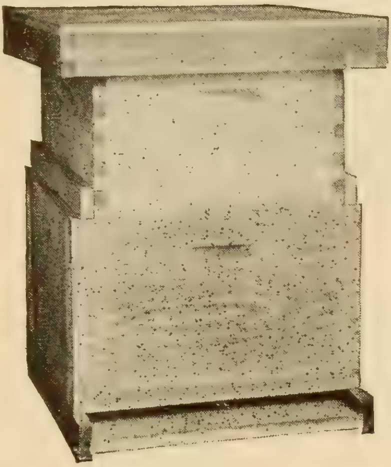
Modified Dadant Hive

Your present brood equipment can be put above the Modified Dadant hive used as full depth supers.

Features are: Deep frames, large one-story brood nest, frame space ventilation, excellence in wintering, swarming easily controlled.

Glance at this illustration to compare this hive with "Standard" Langstroth hive.

You can get 40 per cent greater brood-comb area than in the "Standard" ten-frame Langstroth.



Modified Dadant Hive Features.

1. Eleven frames, Langstroth length, Quinby depth.
2. Frames spaced 1½ inches for swarm control.
3. Extracting frames 6¼ inches deep.
4. Dovetailed body, regular reversible bottom and metal roof cover with inner cover.
5. Langstroth "Standard" equipment easily used with this hive.

For free booklet write any distributor of Lewis "Beeware," or to

G. B. Lewis Company - - - - - - Watertown, Wisconsin
Dadant & Sons - - - - - - - - - - - Hamilton, Illinois

Those delicious vegetables

and glorious flowers that you admired last summer—do you realize that many were grown from Storrs & Harrison seeds?

Perhaps you have thought of us only as nurserymen, knowing that we do the largest nursery business in the country. Our nursery trade was built up by holding the friendship of planters who know they may depend absolutely that any variety we offer has outstanding merit, and

S & H SEEDS DESERVE YOUR CONFIDENCE JUST AS FULLY AS THE SPLENDID TREES, SHRUBS, PERENNIALS AND ORNAMENTALS THAT WE HAVE BEEN PRODUCING THESE LAST 67 YEARS.

Our catalog is a worthy helper for the professional grower and the amateur who appreciate the better varieties.

The Storrs & Harrison Co.

Nurserymen and Seedsmen

BOX 59. PAINESVILLE, OHIO.

Completely Destroys the Weed Growth

More than that, the BARKER breaks the hardest crust into a level, porous, moisture-retaining mulch—**all in the same operation.**

A ten-year-old boy can run it—do more and better work than ten men with hoes. Saves time and labor, the two big expense items.

BARKER WEEDER, MULCHER AND CULTIVATOR

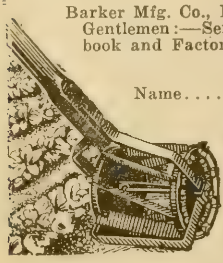
Eight reel blades revolve against a stationary underground knife — like a lawn mower. **Best Weed Killer Ever Used."** Works right up to plants. Cuts runners. Aerates the soil. Has leaf guards, and shovels for deeper cultivation—3 *garden tools in* 1.

FREE ILLUSTRATED BOOK.

Tells how gardeners and fruit-growers everywhere are reducing their work; increasing their yields.—How to bring growing plants through a dry season.—How to conserve the moisture and force a larger, more rapid growth. Send TODAY for this free, illustrated book and special Factory-to-User offer.

BARKER MANUFACTURING COMPANY

Dept. 23. David City, Neb.



Barker Mfg. Co., Dept. 23, David City, Neb.
Gentlemen:—Send me postpaid your free book and Factory-to-User offer.

Name........................

Town ....

State ....

R. F. D. or Box........

Two Thousand Nuclei For Spring Delivery

A great many progressive beekeepers of today buy nuclei to make up winter losses, or in the form of pound packages to strengthen weak colonies. We know this is a good investment, and for a good many years have raised bees in the South, sending them north to catch the honey flow in July and August. It is our policy, in furnishing our customers with bees from our southern apiaries, to furnish bees that give satisfaction to you, as they have to us for the past ten years. We are very particular as to the strain of bees we keep, and the rearing of our queens is in the hands of an expert.

We maintain that the queen is the life of the colony, and they are reared under the most favorable conditions, that of natural swarming, and they are fine large ones with energy to spare, and as good as money can buy. However, we do not sell queens, but we see that a good queen goes with every nucleus we sell. We guarantee you safety against disease, as our bees are inspected constantly, and our apiaries closely watched to see that no disease appears. Our prices as follows:

	April	May	June
1-frame nucleus	$4.00	$3.50	$3.00
2-frame nucleus	5.50	5.00	4.50
3-frame nucleus	7.00	6.50	6.00
4-frame nucleus	9.00	8.50	8.00

Full colonies of bees, $12.00 per colony

1-pound package	$2.50
2-pound package	4.50
3-pound package	6.50

For packages with queens add $1.50 for each package.

WEBER BROS.
HONEY CO.
RIALTO, CALIFORNIA

Made right.

FULL 7/8 INCH THICK.

Priced under favorable manufacturing conditions.

Cypress Bee Supplies

On account of being in the cypress belt and having extremely low operating expenses we are able to offer you the supplies made of the finest soft cypress obtainable, which is almost as soft and light as white pine.

Hives are standard dimensions, dovetailed, hand holds on all four sides, supplied with rabbets, nails, and Hoffman frames. Prices include cover, bottom, body, and frames.

A full line of Root's supplies and Airco Foundation kept in stock. Let us quote you on your 1921 requirements in either Root's or our goods.

8-frame 1-story hives complete in lots of 5	$14.75
10-frame 1-story hives complete in lots of 5	16.00

Above supplied with Root-Hoffman frames at $1.50 extra for 5 8-frame, and $1.85 for 5 10-frame.

Hive Bodies.

Eight-frame	**$0.95 each**
Ten-frame	**1.05 each**

Bottom-boards are made of ⅞-inch lumber throughout. Floor is tongued and grooved together, reversible, of standard dimensions and construction. Price:

8-frame in lots of 5	$0.75
10-frame in lots of 5	.80

Prices of Bees.

Untested queens: 1, $2.00; 12 or more, 1.50 each. Tested queens, $3.00.

1-lb. package without queen	$4.00
2-lb. package without queen	6.75
2-frame nuclei	7.00
8-frame colony	20.00
10-frame colony	22.00

1 carload bees in 8-frame cypress hives for shipment in spring from Helena, **Ga., at $12.50 each.**

Covers.

All covers are flat and reversible. Both one and two piece are the same in every respect, except the one-piece is made from wide clear boards and the two-piece is joined with metal. Cypress covers do not warp.

8-frame two-piece	$0.70
10-frame two-piece	.75
8-frame one-piece	.85
10-frame one-piece	1.00

Absolutely the best cover made.

Fresh stock foundation shipped from factory direct to you at wholesale prices in lots of 50 pounds or more.

SEND FOR CATALOGUE.

The Stover Apiaries

Helena, Ga. **Mayhew, Miss.**

Yes, it is now winter, but spring will soon be here. Have you everything on hand that you will need? Have you veils, smokers, hive-tools, and other appliances?

Have you hives, supers, sections, foundation, extractors, and other supplies? Now is the time to send us your order. If you are wise you will do so.

Order Now
It Will Pay You

F. A. SALISBURY

1631 West Genesee Street
Syracuse, New York

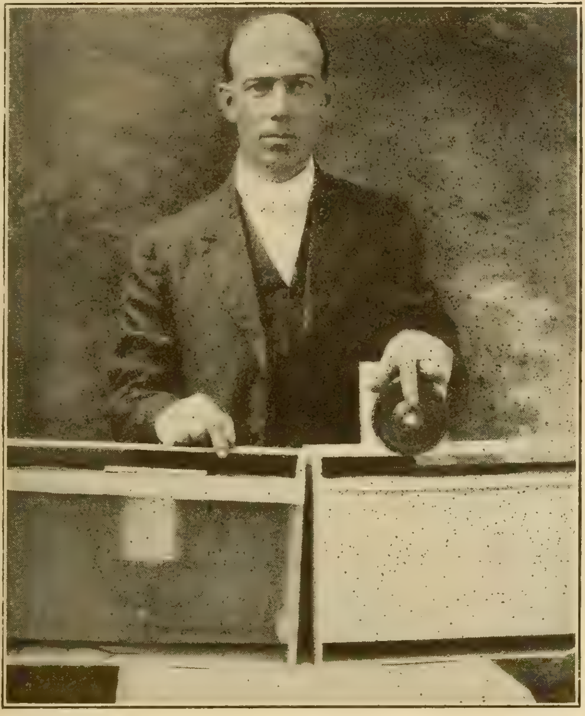
Send for our new catalog.

Order now, and be ready for the bees. Why wait until the last moment when everyone is sending in their orders, and we cannot give you our best attention? Send in your order now. We will give you our best attention.

Send in your order to us here in

We **S**atisfy
Your
Requirements
And you can
Count
Us prepared for
Service
Every time.

THE AULT 1921 BEE SHIPPING CAGE



Patent Pending

1st. It is a dark cage, much more so than the open screen cages we have been shipping in in the past.

2nd. The feeder uses pure sugar syrup. Better than Honey or Candy to ship on; it contains water as well as feed.

3rd. Feeders are made more substantial, 1-3 larger, and have screw cap that will not jar out.

4th. Instead of one small hole, we now use a cotton duck washer in the screw cap that has proven to overcome all the objections found to the liquid feed method.

5th. The Cage is one piece screen wire protected by thin boards on the outside. Send for free circular describing the cage in detail, prices, etc.

Queens—Package Bees—Queens

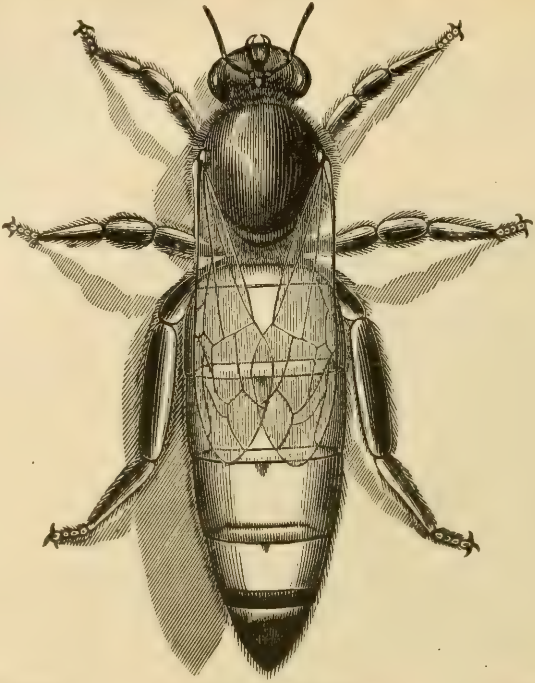
Will book your order with 20 per cent down, balance just before shipping. My Free Circular gives prices in detail, etc. Safe delivery Guaranteed within 6 days of shipping point. We ship thousands of pounds all over U. S. A. and Canada.

1-pound package bees, $3.00 each, 25 or more $2.85 each.
2-pound package bees, $5.00 each, 25 or more $4.75 each.
3-pound package bees, $7.00 each, 25 or more $6.65 each.
F. O. B. Shipping Point. Add price of queen wanted.
1 Untested Queen, $2.00 each; 25 or more, $1.75 each
1 Select Unt. Queen, $2.25 each; 25 or more, $2.00 each
1 Tested Queen, $3.00 each; 25 or more, $2.70 each
1 Select Tested, $3.50 each; 25 or more, $3.00 each

Nueces County Apiaries

E. B. AULT, Prop. --::-- Calallen, Texas

My first peep out on the dawn of a new year.



Highest Quality **Prompt Service** **Satisfaction**

The Reliable Three-Banded Italian Queens

We are now booking orders for 1921. Queens will be ready after May 15th, one-fourth down, balance just before shipping date. Place your orders early, as we fill orders in rotation.

WHY ORDER FARMER QUEENS?

They are bred by as skillful and experienced queen-breeders as can be found in the United States. There are very few places where queens are reared under as favorable conditions as in our queen-rearing yards. We devote our time to rearing as good queens as possibly can be, and we positively guarantee that no better can be reared; we spare neither labor nor money in developing our strain of Italians. It is our intention to improve our original stock each year and to be more skillful queen-breeders. Our first original stock was procured from the highest quality obtainable, which we have proved to the highest point and is now not surpassed by any. Our own eyes inspect every queen that leaves our yards; no culls sent out. Place your orders, and after you have given our queens a fair test and you are not satisfied in every way that they are as good as any you have ever used, just return them and we will send you queens to take their places or return your money. They are very resistant to diseases, the very best for honey-gathering. You take no risk in buying our queens; safe arrival in U. S. A. and Canada; satisfaction is left entirely to purchaser; prompt service given to all orders; every queen guaranteed to be purely mated.

Our Prices:	1	6	12	100
Untested	$1.50	$ 8.00	$15.00	$100.00
Select Untested	1.75	9.50	17.00	120.00
Tested	3.00	14.75	25.00	
Select Tested	4.00	23.00	42.00	

Write for prices on larger quantities than 100.

The Farmer Apiaries - - Ramer, Alabama

Where the good queens come from.

"The Question of Supplies."

(A paper read by C. F. Bender of Newman, Ill., at the recent meeting of the Illinois State Beekeepers' Convention, and printed in the American Bee Journal for January, 1921.)

Having been called upon for a paper to be read before this convention, it seemed to me that a full discussion of this subject from the beekeeper's standpoint might be of interest. I wish to assure you at the outset, that I am in no way interested in the sale of bee supplies, but view the matter solely as a purchaser. Having decided upon my own policy with regard to the purchase of supplies for the coming season, it may be useful to give you the facts and fancies on which that decision is based.

I have just returned from a month's vacation in which I visited some of the largest supply factories, making a leisurely visit at each, with a view to learning present conditions, as well as future prospects. I will confess that I went as a missionary to these benighted brethren, saying: Lo, the poor bee man! How is he to pay war prices for his supplies, and take a chance on selling his honey next fall?

I was surprised to find that they were already true believers. They knew all that I had to tell, and much more. Instead of darkly plotting how they were to keep up the prices of supplies, they were anxiously and even prayerfully considering how these prices might be reduced. They told me that the factories must be run through the winter, if the demand next summer is to be supplied; that if they are run through this winter, materials and labor must be purchased at prices that average less than 10 per cent below the highest war prices. Coal and iron, lumber, beeswax, labor, were still selling at astonishing prices. Freight rates on those materials were higher than ever before. Taxes were a burden, interest on borrowed capital unusually high, and in many cases borrowed money was not to be had at any price. Considering all these things, it would be folly to store a large stock of supplies, in the hope of selling them next summer. The only course left was to run the factories short-handed, storing only such a stock as would certainly be sold, at nearly the present level of prices. This in the hope, not of making a large profit, but of avoiding a heavy loss.

It seems to me that our problem, while apparently the same as that of the manufacturers, is really different, because the labor employed is largely our own. Unless we are to abandon our business entirely, it will not profit us to limit the production of honey because our supplies cost us twenty per cent more than they will probably cost us a year later. It will not even pay us to limit increases on account of the high prices of hives, because the net profit per colony for one season will more than cover any probable reduction in the price of hives during that year.

If these statements are accepted as facts, there only remains for us one possible question. Shall we buy our supplies now, so far as we can foresee our needs, or shall we wait until spring or summer, in the hope of getting them cheaper? In my mind that question, also, is easily answered. I have tried to show you that the factories and dealers are carrying only small stocks, and that a normal demand during the busy season cannot be supplied. Consequently, if we wait until the last moment, there is danger, not only that we shall be obliged to pay higher prices, but that we shall not get our supplies at all.

Our only consolations are, that we have used some low-priced supplies in the production of high-priced honey—that, as we have gone up with the commercial balloon, we must come down as it cools off, as other producers are doing, and must content ourselves with reduced profits, hoping for better times in the years to come.

My prediction is that the lowest prices for supplies during the year will be those quoted in the January catalogs. Acting on that belief, I have already ordered my supplies for the next season and expect to do business at the old stand, in quite the usual manner, in 1921.

The A. I. Root Company

Medina, Ohio.

Why Buy Now?

Winter is the time to make up your hives, supers, and supplies for the spring. Prospects are good. Bees are in good shape, clover looks promising. Be prepared.

CONGESTED DEMAND in spring, owing to a hesitancy of many to order will be apt to cause the extra delays in the busy spring months. Get your order in ahead of the rush.

3 PER CENT DISCOUNT in February makes buying early advantageous.

SLOW FREIGHTS are apt to delay your material and may result in goods arriving too late unless ordered early.

Why Buy of Us?

REPUTABLE GOODS. We handle only such goods as we can absolutely recommend as first class, perfect fitting, perfect using.

PROMPT SHIPMENT. We carry always a large stock of goods and pride ourselves on the promptness with which we can get out orders for our customers. Delays in transit are largely obviated by rushing tracers after the goods on request of the customer.

SATISFACTION GUARANTEED. We guarantee absolutely that our goods will be satisfactory in material and workmanship. In fact we guarantee satisfaction in every way.

Write giving list of your requirements. We will give you our lowest cash price.

DADANT'S FOUNDATION —Every inch, every pound, every ton equal to any sample we have ever sent out. Specify it to your dealer. If he hasn't it write us,

Dadant & Sons

Hamilton, Illinois

Catalog and Prices on Bee Supplies, Beeswax, Wax Working into Comb Foundation and Comb Rendering for the asking.

Gleanings in Bee Culture

LIBRARY of the
Massachusetts
MAR 4 - 1921
Agricultural
College

The Passing of the Log Gum in the South.

VOL. XLIX **March, 1921** NUMBER 3

QUEENS and BEES
WHEN YOU WANT THEM

We are establishing one of the most modern Queen-rearing outfits in the United States, and will breed from New Imported Italian Blood. We are not going to tell you how many Queens we will put on the market, as we shall produce QUALITY instead of QUANTITY.

A limited number of orders for spring delivery will be accepted at the following prices:

Quantity	1	6	12	24
Untested	$2.00	$11.40	$21.60	$40.80
Sel. Untested ..	2.25	12.80	24.30	45.90

We are also prepared to furnish full colonies, nuclei, and pound packages for spring delivery. Write today for prices.

THE A. I. ROOT COMPANY
OF TEXAS
P. O. Box 765, SAN ANTONIO, TEX.

¶ Send in a list of your requirements today and get our special prices on all supplies.

Miller Box Manufacturing Company

201-233 N. Avenue Eighteen
Los Angeles, Calif.

Boyer's "Quality-First" Tin Honey and Syrup Containers

are the best and cheapest in the long run. Prompt shipments of all standard sizes and styles. **Can manufacturers since 1892. Large capacity.** If you cannot secure them from your usual supply house, write us your needs.

W. W. Boyer & Co., Inc.

2327-2359 Boston Street - - - - Baltimore, Md.

The New Buckeye Extractor

We have a carload of extractors on the way here from our Eastern factory. As the new Buckeye continuous automatic reversing extractors in this car will be snapped up quickly, anyone desiring one of these machines should place their orders at once.

Write for particulars regarding any style of extractor. We will have a complete assortment when this shipment arrives.

The A. I. Root Company of California

Los Angeles: 1824 E. 15th St.
San Francisco: 52-54 Main St.

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A. I. Root, Editor Home Dept.
Iona Fowls, Assistant Editor
H. G. Rowe, M'n'g Editor

Muth's Ideal Veil, $1.50

MEET GUY LE STOURGEON, SAN ANTONIO, TEXAS, the president of the American Honey Producers' League. He's a real man, fighting for a real League, wearing a real Bee Veil.

WE HAVE A STOCK OF LEWIS Beeware waiting for your orders. Send us a list of your requirements, and we will quote you attractive prices on quality goods. Write for our catalog.

SEND US A SAMPLE OF YOUR honey and name your most attractive price delivered to Cincinnati. We pay you the day shipment is received.

WAX, OLD COMBS. We pay you the highest market price for rendered wax, less 5c per pound, rendering charges. Our rendering process saves the last drop of wax for you. Write for shipping tags.

BEES—TWO FRAME NUCLEI, with queen, $8.50. Order them early.

The Fred W. Muth Co.

Pearl and Walnut Sts.
CINCINNATI, O.

FOUNDATION MILLS TURNING

And we are making that famous product, THE NEW PROCESS AIRCO FOUNDATION, on our own machines, here at Council Bluffs. Let us send you a sample, for we believe it is absolutely the last word in foundation. Severest tests will convince you that you cannot afford to be without AIRCO in your own yard. It pays—that's the big point about it!
If you are in the habit of having your wax worked into foundation, send for our terms and prices. Let us quote, too, on your season's needs in foundation, for we believe that we can interest you.
Use AIRCO, it pays.

THE A. I. ROOT CO. OF IOWA, Council Bluffs, Iowa

"SUPERIOR" FOUNDATION

Yes, we are ready for the rush. Many tons now ready for shipment, and our machines are running to utmost capacity. Use the best. If your dealer can't supply you, write us for price, stating quantity required. We also accept beeswax for foundation or supplies.

''Everything in Bee Supplies''

SUPERIOR HONEY COMPANY
OGDEN, UTAH.
(Manufacturers of Weed Process Foundation)

BEE SUPPLIES

Root's Goods at Factory Prices
With Weber's Service

We carry several carloads of bee supplies, and are able to give prompt shipment at all times. Our motto is a customer must be satisfied; give us a trial and we will show you how quickly we will answer your correspondence; send your order and it will follow 24 hours after we receive it. Our new catalog will be ready about January 15th; send for same. We have thousands of satisfied customers; why not you? Send a list of your wants and we will quote you.

C. H. W. Weber & Co.

2163-65-67 Central Ave., Cincinnati, Ohio.

TINS AND GLASS JARS

Down in Cost---Order Now for Next Crop Packing. Note Low Prices Subject to Change at Any Date

2½-lb. Cans.

2 dozen reshipping cases	$1.45 per case net
In 100-can crates	$6.50 per crate net
In 200-can crates	$11.00 per crate net
In 500-can crates	$24.50 per crate net

5-lb. Pails with Handles:

1 Doz. reshpg. cases	$1.35 per case net
In Crates of 100	$8.30 per crate net
In Crates of 200	$16.25 per crate net

10-lb. Pails with Handles.

In ½ Doz. cases	$1.10 per case net
In crates of 50	$6.70 per crate net
In crates of 100	$12.75 per crate net
5-Gal. tins, used, good condition, 2 to case	50c per case
5-Gal. tins, NEW, 2 tins to wood case....	$1.35 per case

WHITE FLINT GLASS, WITH GOLD LACQD. WAX-LINED CAPS.

8-oz. Honey Capacity, Cylinder style	$1.50 carton of 3 doz.
16-oz. Honey Capacity, Table Jar style	$1.40 carton of 2 doz.
Quart or 3-lb. Honey Capacity, Mason Style	$1.00 carton of 1 doz.

HOFFMAN & HAUCK, INC. - - Woodhaven, New York

SEND TO INDIANAPOLIS FOR YOUR BEEKEEPER'S SUPPLIES

Our stock is new and complete and we are prepared to give the best of service. Send for 1921 catalog. They will be out soon after the first of the year. Gleanings subscriptions also taken.

THE A. I. ROOT COMPANY, 873 MASS. AVE., INDIANAPOLIS, IND.

HONEY MARKETS

The situation is just about as it has been—neither better nor worse. When the buyers' strike is over (and it can not last much longer) we may expect a much better demand for honey as well as all other commodities. We would advise beekeepers not to ship to the big markets, but dispose of their honey locally as far as possible. Some beekeepers have done well in selling in five and ten pound pails. They have disposed of their crops and have helped to advertise the value of honey as a food in their own locality. What some have done others may do.

U. S. Government Market Reports.

SHIPPING POINT INFORMATION.

SOUTHERN CALIFORNIA, LOS ANGELES.—Wire inquiry light, general market conditions very unsettled, with lower prices and weak tone, still lower prices expected by many. Eastern buyers reluctant to order solid carloads, and mostly cars are consigned to be sold in small lots by brokers in the large markets. Independent shippers hesitate to ship unsold, due to uncertain conditions in consuming centers. Nominal quotations f. o. b. usual terms, per lb.: White orange blossom 14-15c, white sage 12-14c, light amber sage 10-12c, white alfalfa 10-11c, light amber alfalfa 7-8c, white Hawaiian 8c, light amber Hawaiian 6c. Beeswax, sacked in less than carlots, 33-35c per lb. No comb honey will be available until new crop comes on in September.

INTER-MOUNTAIN REGION (COLORADO AND IDAHO).—Extracted honey moving slowly in less than carlots, and little comb being shipped. Comb honey is being offered around $6.75 per 24-section case in large lots, and extracted sweet clover and alfalfa at 10-11c per lb. Shipments are only a small fraction of last year's and a large holdover is expected, as beekeepers refuse to sell at prevailing prices. Some organizations are endeavoring to dispose of their stock by sales direct to the consumer.

OTHER SECTIONS.—In the Catskill Mountain district it is reported that less than 10 per cent of the crop remains in hands of the beekeepers, altho in the central portion of New York State the proportion is said to be somewhat larger. Most sales at this time are made direct to the consumer in glass jars and small pails. Wisconsin clover is said to be still held for 18c per lb. Western white sweet clover and light amber alfalfa is generally quoted around 10-11c per lb., f. o. b. shipping points.

TELEGRAPHIC REPORTS FROM IMPORTANT MARKETS.

BOSTON.—1 car Porto Rico arrived since last report. Comb honey in light demand but steady. Porto Rico honey in good demand and practically cleaned up. Almost no demand for other extracted honey on account of low prices for Porto Rico stock. Comb: Sales to retailers, New York, 24-section cases white clover No.1, heavy, $8.50-9.00; light, $7.00-8.00; Vermont, 20-section cases white clover No. 1 heavy, $8.50; light, $7.50. Extracted: Sales to confectioners and bottlers, Porto Rico, amber per gal., 80-85c; California, white sage, very few sales 18c. Beeswax: Few sales of foreign wax and almost none of light domestic. Inquiry is mostly for cheap waxes. Sales to floor wax, candle and shoe polish manufacturers, domestic light, 32-35c; African, dark, 17-20c.

CHICAGO.—No carlot arrivals since last report. Supplies liberal, movement very slow, due apparently to mild weather and easier sugar situation, market tone very weak and most sales in small lots, most stock now arriving on commission. Extracted: Per lb., sales to bottlers, Iowa, Montana, California, white alfalfa and sweet clover mixed, 14-14½c; light amber alfalfa and sweet clover mixed 13c. Comb: Sales to retailers, Colorado, Montana, Minnesota, 24-section cases alfalfa and clover, heavy $6.50-6.75; light and leaky, $4.50-5.50. Beeswax: Receipts since last report approximate 1 car from Oklahoma, Texas, South America, and Africa. Market very weak and movement draggy. Foreign wax injuring market. Sales to wholesale druggists and harnessmakers, Oklahoma and Texas light, 30c; dark, 26-28c. Imported, dark, 25-26c.

CINCINNATI.—No carlot arrivals since January 31. Light l. c. l. receipts. Demand and movement poor, market unsettled. No record of sales available.

CLEVELAND.—No arrivals since last report. Little interest being shown, demand being mostly from retail trade for bottle or package goods. Extracted: Quotations to bakers, 60-lb. cans small lots western white sweet clover, 16½ to 20c per lb.

DENVER.—Arrivals light, demand slow, movement very light. Sales to jobbers, extracted: Colorado, white, 13c; light amber, 12½c; amber, 12c.

KANSAS CITY.—1 car California, 1 car Oregon arrived since last report. Supplies liberal, demand and movement slow, few sales, market weaker on both comb and extracted, prices slightly lower. Sales to jobbers, extracted: California, light amber alfalfa, 14-15c per lb. Comb: California, 24-section flat cases light amber alfalfa, No. 1, $6.00-6.50.

MINNEAPOLIS.—No carlot arrivals. Quotations direct to retailers, supplies moderate, demand and movement slow, market weak, season practically over. Trade showing very little interest in carlots and would be difficult to move another car even with marked drop in price. California and Minnesota white clover, 17-18c; western, dark amber offered low as 12c. Comb: Supplies light, demand and movement slow, market dull. Western, cases 24-section No. 1, alfalfa and sweet clover mixed, $8.00.

NEW YORK.—L. c. l. receipts from New York moderate, from California light. Demand and movement very light, market dull; bottlers, confectioners and bakers doing practically all the buying; most sales are on South Amerian and West Indian stock, as California honey is still considered too high. Sales to jobbers, large wholesale grocers, confectioners, bakers and bottlers. Extracted: Domestic per lb., Californias, light amber alfalfa and white alfalfa, prices slightly higher 12-13c; few, 13½c; white orange blossom and white sage, 15-16c, few 17c. New York, sweet clover, 14-15c; few 16c; buckwheat, 12-13c; imported, West Indian and South American, refined, 5½-6c; few high as 7c per lb.; best, 60-65c; some low as 50c per gallon. Comb: No sales reported. Beeswax: New York and foreign l. c. l. receipts moderate. Supplies moderate, demand and movement slow, market dull, most sales being made to manufacturers and bleachers. Sales to jobbers, wholesalers, and manufacturers, South American, West Indian and European, light, best, 26-28c; slightly darker stock, 20-25c; dark, 18-20c; New York light, best, 28-30c.

PHILADELPHIA.—No arrivals. No sales or purchases being made of either comb or extracted the past two weeks. Beeswax: Supplies liberal. Slight improvement in inquiry noticeable, but very little business being transacted. Sales to manufacturers, South American and European, red, 18c.

ST. LOUIS.—Comb: Very light receipts reported. Supplies moderate but adequate. Movement very limited and confined entirely to sales in small lots to retailers. Market shows no activity and is weaker. Sales to retailers, Colorado, 24-section cases, white clover and alfalfa No. 1, heavy, mostly around $7.00. Extracted: Very light receipts reported. Supplies liberal and adequate, practically no demand or movement, market very unstable and weaker. Sales in small quantities to retailers in 5-gallon cans, per lb., Missouri, Arkansas and Mississippi, light amber various mixed flavors, 12-14c; California, light amber alfalfa, 10-12c. Beeswax: Receipts and supplies light. Practically no movement, market weaker, few sales in small lots to jobbers and manufacturers of floor wax and comb foundations. Missouri, Arkansas, and Mississippi, light, 23½c.

GEORGE LIVINGSTON,
Chief of Bureau of Markets.

Opinions of Producers.

Early in February we sent to actual honey-producers in California and the South the following questions:

1. What is the amount of brood and bees in the hives as compared with normal?
2. Is the amount of stores in the hives sufficient to carry the colonies thru to the main honey flow?
3. What is the condition of the early nectar and pollen plants?

4. What is the condition of the soil for the later main honey plants?

Answers, as condensed by the editor, are as follows:

ALABAMA.—More brood than usual at this time. Bees have consumed more stores than usual on account of warm weather. Plants looking fine. Prospects are as good as I have ever seen.—J. M. Cutts.

CALIFORNIA.——Amount of brood and bees normal. Stores not sufficient. Condition of plants good. Not enough moisture in soil.—L. L. Andrews.

CALIFORNIA.—From one to four combs of brood and bees. Plants in good condition. Soil needs more rain to insure crop.—M. H. Mendleson.

CALIFORNIA.—Brood and bees as good as usual. Plenty of honey in most apiaries. Plants normal. Soil in good condition, but will need more rain later.—Geo. B. Farinan.

FLORIDA.—Amount of brood and bees normal. Stores sufficient. Condition of plants good. South Florida had a good rain lately.—Ward Lamkin.

FLORIDA.—Amount of brood and bees 15 to 20 per cent above normal. Stores sufficient. Condition of plants above normal, and of soil good.—C. H. Clute.

LOUISIANA.—Condition of brood and bees about 75 per cent. Stores are not sufficient. Condition of plants good, and of soil normal.—E. C. Davis.

MISSISSIPPI.—Amount of brood and bees 125 per cent. Stores not sufficient. Plants are in excellent condition, soil abnormally dry.—R. B. Wilson.

TEXAS, EAST.—Amount of brood and bees normal. Plenty of stores with favorable weather. Condition of plants normal, of soil 85 per cent.—T. A. Bowden.

TEXAS.—Small amount of brood, bees about normal. Plenty of stores. Soil in fine condition for mesquite.—J. N. Mayes.

TEXAS.—Amount of brood and bees 110 per cent. About 10 per cent of colonies will need feeding. Condition of plants good, soil too dry.—H. B. Parks.

Special Foreign Quotations.

LIVERPOOL.—Market continues slow with lower prices. Sellers are pressing their stocks at reduced prices, but without result. Buyers seem inclined to base their prices on pre-war prices. At today's rate of exchange the value of extracted honey is about 6 to 7 cents per pound. The beeswax market is much weaker. The value in American currency is about 20 to 21 cents per pound.

Liverpool, England, Feb. 2. Taylor & Co.

ROOT'S BEE SUPPLIES.

I can make immediate shipment for early orders, and you can get the discount by ordering early.

A. M. MOORE, Zanesville, Ohio.

22½ South 3rd St.

Thagard's Italian Queens

Bred for quality. My three-banded queens are bred from imported stock; they are hardy, prolific, gentle, disease-resisting, and honey producers. Circulars free.

	1	6	12
Untested	$2.00	$8.00	$15.00
Select Untested	2.25	10.00	18.00
Tested	3.00	16.00	28.00

V. R. THAGARD

Greenville, Alabama

LISTEN BEEKEEPERS

We wish to tell the readers of Gleanings that the Bank of Perris has taken over about 500 hives of bees which we wish to sell as follows:

Nuclei Will Be Our Specialty.

One frame with queens, $3.00; 2 frames and queen, $5.00; one pound with queen, $2.50; 2 pounds and queen, $4.00; 8-frame Single-story colonies, $10.00, F. O. B. Perris.

Young laying queens, $1.50 each; $8.00 for 6; $15.00 per dozen; 50 to 100 or more, $1.00 each.

We have a man in charge with long experience in bee-shipping. Let us book your orders with 10 per cent with same, balance when bees are wanted. Ask for special prices on large order. Shipping season begins May 10th. Safe arrival and satisfaction.

Address

BANK OF PERRIS

PERRIS, CALIF.

Pure Italian Queens of the Best Known Strain

Booking orders now for spring delivery of two-frame nuclei, two-pound packages, and full colonies.

Prices	1	12
Untested	$1.50	$14.50
Tested	2.25	24.00
Select Tested..	3.00	30.00

Two-frame nuclei with untested queens, $6.00; twenty-five or more, $5.50.

Two-frame nuclei with tested queens, $6.75; twenty-five or more, $6.25.

Two-pound packages hybrid bees, each $4.00; add price of queens wanted.

I have for sale fifty colonies black and hybrid bees in factory-made pine hives. eight-frame Langstroth dimensions, most combs drawn from wired foundation, shallow supers with frames included. Price f. o. b. Bagwell, Texas, $8.50 per colony. Will sell in lots of five or all to one party.

No disease near here; health certificate with all I have for sale. Safe arrival and satisfaction guaranteed. Terms: One-fourth with order; balance due at shipping time.

Baughn Stone

Manchester, Texas.

MAKE THIS YEAR A COMB HONEY YEAR

Normal conditions are returning, and with them Comb Honey is receiving better proportionate returns than extracted. There is and will be an under-production of comb honey.

TWO SUGGESTIONS

1st. Use comb-honey equipment you now have.
2nd. Get more equipment, and make it "Root quality."

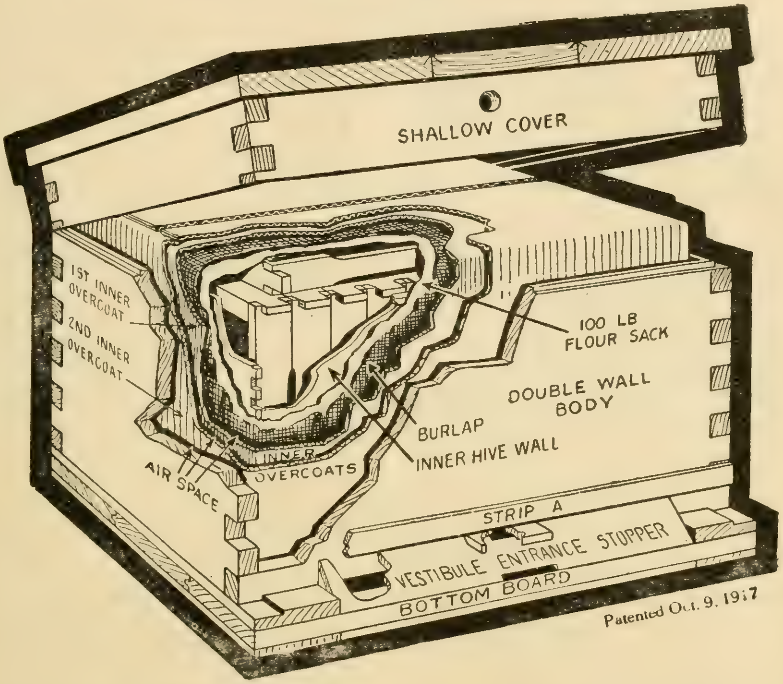
We would like to talk with you about the matter.

Write us regarding it, and also ask for our 1921 catalog.

**WE ARE ALWAYS
AT YOUR SERVICE**

M. H. HUNT & SON
510 North Cedar Street
LANSING - MICHIGAN

Winter Problem Solved by the Hive With an Inner Overcoat


SHALLOW COVER
1ST INNER OVERCOAT
2ND INNER OVERCOAT
100 LB FLOUR SACK
DOUBLE WALL BODY
BURLAP
INNER HIVE WALL
INNER OVERCOATS
AIR SPACE
STRIP A
VESTIBULE ENTRANCE STOPPER
BOTTOM BOARD
Patented Oct. 9. 1917

Furnished with Jumbo depth or Standard Hoffman Frames.

In your purchase of hives for the coming season, consider the fact that, if well taken care of, they should last a lifetime. A lifetime matter is a serious one, and nothing but the best that money can buy should have your consideration. The Hive with an Inner Overcoat is the best on the market as to material, workmanship, and efficiency. The outside wall is made of ⅞ material, the best for the purpose. Any extra cost over ordinary hives, spread over its lifetime, is very low. The saving in bees, in a single winter, may more than pay for the entire investment. Winter losses in ordinary hives during the winter of 1919-20 in many cases were 75% or more. What a tremendous loss! The Hive with an Inner Overcoat will winter normal colonies, without loss.

Send for a special circular showing large illustrations. New 1921 illustrated catalog of beekeepers' supplies now ready. Send us a list of your requirements for the coming season.

TIN HONEY PACKAGES

2 lb. Friction top cans, cases of 24.
2 lb. Friction top cans, crates of 612.
2½ lb. Friction top cans, cases of 24.
2½ lb. Friction top cans, crates of 450.
5 lb. Friction top pails, cases of 12.
5 lb. Friction top pails, crates of 100.
5 lb. Friction top pails, crates of 200.
10 lb. Friction top pails, cases of 6.
10 lb. Friction top pails, crates of 100.

Special prices on shipments direct from factory in the East or West.

100 5-lb. Friction top pails	$ 8.50
200 5-lb. Friction top pails	16.00
100 10-lb. Friction top pails	12.50
Pint Mason Jars, flint glass, per gross	$9.00
Quart Mason Jars, flint glass, per gross	10.00

A. G. WOODMAN COMPANY, Grand Rapids, Mich.

The Large Hive

has proven to us through fifty years' experience its superiority. In fact we have yet to learn of a single beekeeper, once having used our larger hive, ever returning to the smaller one. Its use is convincing of its superiority.

BEST WINTERING because if properly handled it gives strong colonies in fall, with abundance of stores on few frames, immediately above and behind the brood-nest.

BEST HONEY PRODUCING because it gives large, strong colonies for the honey flow, and abundance of room for brood and honey. Shallow supers do away with queen-excluders.

BEST NON-SWARMING because there is ample laying room for the most prolific queen, ample storing room for the workers, and ample ventilation for all.

The Modified Dadant Hive

has embodied in it all these advantages and lends itself readily to use with Langstroth equipment. Frames are Langstroth length, Quinby-Dadant depth, regular Hoffman style space 1½ inches from center to center. Hives regular dovetailed, metal cover and reversible bottom.

Try them and be convinced. Booklet for the asking. Ask for quotations on any size lot you want.

DADANT'S FOUNDATION—Every inch, every pound, every ton equal to any sample we have ever sent out. Specify it to your dealer. If he hasn't it, write us.

Dadant & Sons

Hamilton, Illinois.

Catalog and Prices on Bee Supplies, Beeswax, Wax Working into Comb Foundation and Comb Rendering for the asking.

GLEANINGS IN BEE CULTURE

MARCH, 1921

EDITORIAL

The A. H. P. L. Meeting.

The annual meeting of the American Honey Producers' League was held at Indianapolis, Feb. 15, 16, and 17. Just as we go to press we learn that among the most important things done at this meeting was the making of plans for an advertising program involving the expenditure of $6,000 for advertising honey as a food. This amount of money was pledged at this meeting by those in attendance. Further particulars will be given in these columns later as this advertising campaign develops.

Another matter of importance in the transactions at Indianapolis was the adoption of a resolution favoring a tariff of 48 cents per gallon on honey imported into the United States.

* * *

The Dr. Miller Memorial.

KEEN interest is manifested by beekeepers thruout the country in regard to providing a lasting memorial for the late Dr. C. C. Miller, as announced in our last issue. Some are already sending in their contributions for this purpose. As Gleanings understands it, the plans which are being made provide that a memorial fund is to be raised by popular subscription, the money to be sent on Dr. Miller's birthday, June 10, to designated receivers of subscriptions. It will be well for every beekeeper who desires to contribute to this fund to set aside the money for this purpose **now**, to be sure that it will be ready to send on June 10. Gleanings will announce the names of the designated receivers of these subscriptions as soon as the committee which has this in charge perfects its plans as to the handling of this fund.

* * *

Honey Exports and Imports.

THE Bureau of Markets has just isued a statement covering the calendar year 1920, showing the exports of honey from the United States and where this honey was sent, the data having been secured thru the Bureau of Foreign and Domestic Commerce. From this we learn that the total exports by months are as follows: January, 352,078 pounds; February, 335,656 pounds; March, 81,653 pounds; April, 56,835 pounds; May, 13,755 pounds; June, 28,258 pounds; July, 10,823 pounds; August, 27,498 pounds; September, 22,256 pounds; October, 152,530 pounds; November, 176,367 pounds; December, 282,016 pounds. The total for the year was 1,539,725 pounds.

The largest amount sent to any one country was 436,263 pounds, to the United Kingdom, most of this having been sent during January, February, and March. The Netherlands stands second as to the amount of honey received, the total being 321,078 pounds, most of which was sent during October, November, and December. The report also shows that 392,118 gallons of honey was imported into the United States during the last half of the year, most of this coming from Cuba and Hayti.

During the last five months of 1920, 113,804 pounds of beeswax was exported from the United States. During the same period a total of 1,028,430 pounds was imported.

* * *

The Isle of Wight Disease.

DR. JOHN RENNIE, D.Sc., F.R.S.E., gave a paper on the Isle of Wight disease, at a meeting of the Aberdeen Natural History and Antiquarian Society of Aberdeen, Scotland, on Jan. 21, in which he is reported to have stated that a number of samples of bees from other countries, including the United States, had been examined in his investigations; but in no case has the organism **Torsonemus Woodi**, the recently discovered cause of the Isle of Wight disease, been found in samples received from any other country. While this may make it appear doubtful that the discovery of this mite as the cause of the Isle of Wight disease will explain some of the mysteries connected with the adult bee diseases found in this country, such as paralysis, disappearing disease, etc., there is no telling at this time what a careful search for these mites in many samples of sick bees gathered in this country may reveal.

Detailed reports of the results of Dr. Rennie's investigations have so far not been published, owing to certain formalities.

Bees Restless in Cellar.

MARCH is the most trying month for bees that are wintered in the cellar. If they are quiet at this time and show no indications of dysentery, they may be expected to come thru in good condition. On the other hand, if they are noisy now at ordinary temperatures and spot their hives around the entrances they will continue to be restless and will waste their vitality faster and faster from now on until they can be put outside and relieve themselves by a cleansing flight. When bees become noisy in the cellar because the temperature is too high or too low or because of stagnant air in the cellar, the trouble can usually be remedied; but when they become restless because of accumulated feces, resulting from the consumption of honey which contains a considerable amount of indigestible matter, the only remedy is a good flight in the open air. Putting the bees out on a mild day for a cleansing flight and then returning them to the cellar has been tried as a remedy for this condition, but it is not practiced to any extent at the present time. When the trouble has gone so far that the bees spot their hives badly at this time it is already rather late to apply the remedy, since their vitality is usually so reduced and the bees so greatly aged that the colony will dwindle rapidly in the spring. If the bees are quiet at this time, a cleansing flight is unnecessary and they will fare better if left in the cellar until they can be put out to stay.

* * *

When Should Bees Be Taken from Cellar?

THOSE who winter their bees in cellars will anxiously watch the weather during the latter part of March for a suitable time to put the bees on their summer stands. It sometimes happens that the weather is too cold or too stormy the latter part of March, and the bees must be left inside until early April.

If the bees have wintered well and are quiet now, a difference of a week or two in the time they are put out may not make much difference to the bees; but it should be remembered that, unless they are wintering exceptionally well, a week's confinement in the cellar late in March or early in April may cause the bees to age more than a month or more last fall.

It was formerly thought that bees wintered in the cellar are less hardy when put out in the spring than those wintered outside and should, therefore, be left in the cellar until late in April, to protect them from the cold spells of early spring. This is true of colonies that have wintered poorly in the cellar, but this is probably because the bees have aged greatly from their restlessness in confinement rather than because of any lack of hardiness resulting from being in the cellar during the winter.

In fact, colonies that have wintered well in the cellar should be better able to endure cold spells during early spring than those which have been exposed to the lower temperatures outside. The time-honored rule, to put the bees out when the soft maple begins to bloom, is probably as good as any. In the northern portion of the United States, well-wintered colonies, when set out in a sheltered location during the latter part of March or the first week in April, usually fare better than if left much later.

* * *

Drifting in the Spring.

ANY THING that will cause the bees to rush madly from their hives in great numbers for their first flight in the spring will cause drifting. In bad cases of drifting so many bees may return to a few hives that these colonies become abnormally strong, while other colonies lose so many of their bees that they are reduced to mere nuclei.

Colonies that are wintered outside are sometimes inclined to drift if the hives are too close together; but, if they have had frequent flights during the winter, they do not often cause trouble from drifting.

Bees that are put out of the cellar during the middle of a warm day, with entrances left wide open, will rush out in such great numbers in their eagerness for flight that they fail to mark their locations, and drifting is sure to follow, since in returning they are inclined to enter the hive having the greatest commotion at the entrance. Bees that have wintered poorly are usually more inclined to drift than bees that have wintered well.

Anything that tends to reduce the volume of flight on the first flight-day will reduce the tendency to drift. A thorough airing of the cellar, by leaving the doors wide open during a night or two just before the bees are to be taken out, causes them to be quieter while being carried out and afterwards to fly in a more nearly normal manner. Closing down the entrance to an inch or less in width before they begin to fly will prevent too many bees rushing out at once, thus helping to prevent drifting. Good wintering, a thorough airing of the cellar the night before, careful handling of the hives while carrying them out, and contracting the entrances immediately on placing the hives on their summer stands should prevent any trouble from drifting.

If the bees are put out at a time when it is too cold for them to fly and the entrances are contracted, they will usually take their first flight without drifting. When they have wintered well no apparent harm is done even if they are not able to fly for several days after being set out; but, if they have wintered poorly, this would be a dangerous procedure. By consulting the daily weather map, issued by the Weather Bureau, it should be possible to set the bees out the day before the arrival of the flight-day, which is a great advantage.

GRADING THE COMBS

Different Grades of Combs for Different Uses. Advantage of One Size of Frames for Brood-chambers and Supers

By Morley Pettit

OF all the apparatus used in beekeeping the comb is the most important. Without it the honeybee colony could not exist. Its cells and surfaces form the base for all colony life. Here the young are reared, the food is stored, and the adults work or rest. Comb consists of hexagonal cells of various sizes and degrees of regularity. The cells are classified by shape and measurement. When measuring across the parallel sides of a row of cells those which are nearly regular and run more than four and a half cells to the inch will be used freely by the queen for worker eggs. Those which are four and a half to the inch and larger cannot be depended on to get anything but drones. Regular drone-cells measure about four to the inch. Cells which are distorted by transition from one size of regular cells to another or by the stretching of the foundation are seldom used by the queen. Pollen is stored only in regular worker-cells, honey in all kinds. This classification gives rise to the following names commonly used by beekeepers: Worker, drone, accommodation, and stretched cells.

The commercial beekeeper gets the bees to build their comb in frames for his convenience. From his standpoint "a comb" is the name given to the whole sheet of comb contained in any one frame. A frame may contain all the different types of comb, but for practical purposes it must be considered as a unit. "Combs," then, must be classified by the beekeeper according to their fitness for his different uses, and under a classification which is distinct from, tho based on, the one described above. In the Pettit Apiaries the grades are numbered with subdivisions.

All Combs Sorted Into Four Grades.

No. 1 combs have all worker-cells above the middle, except at most two rows of malformed cells next the top-bar, and a few such cells scattered near the ends. In the lower half of the frame a total of 10 square inches of non-worker cells and open space is allowed. The foundation is straight in the middle of the frame. As we are often troubled with an excess of pollen, this has to be considered in grading combs. If a No. 1 comb contains pollen in more than 25 per cent of the cells, it is graded No. 1P and stored separately for special use. When a surplus of these accumulates the heaviest ones are graded No. 4 for rendering into wax.

No. 2 combs are built on full sheets of foundation which thru one accident or another have stretched or buckled so as to disqualify them for the No. 1 class. They have no more drone-comb or open space than No. 1 combs and must not contain more than a very small percentage of pollen cells. Each comb in this class is given a conspicuous mark on the top-bar.

No. 3 combs contain drone-comb in the upper half of the frame, or more than 10 square inches drone-comb and open space in the lower half; but are fairly light in color and weight and contain practically no pollen. They are an odd assortment, mostly built on starters and suitable only for extracting.

No. 4 combs are for rendering into wax—rejects from all other classes. In this class are the surplus pollen combs, the No. 1's which are very heavy with age, the No. 2's which are anyways black and heavy, the broken and very irregular ones.

When the Sorting Is Done.

All combs not in brood-chambers are sorted annually. I might say all combs are sorted annually, as the sorting of combs in brood-chamber use proceeds whenever brood-chamber manipulations are being carried on. The practiced eye quickly spots a No. 2 comb in a brood-chamber where it has no right to be, by the rim of honey-clogged or unused cells below the top-bar. Where colonies have been supered properly the queen's failure to fill brood right up to the top-bar is the fault of either the comb or the queen. Lower-grade combs are marked as soon as detected in the brood-chamber and removed to the super either at once or later.

The sorting of surplus combs takes place at the annual round-up of supers during the milder weather of the inactive season. At this time the frames are scraped more or less thoroughly as time permits, and combs transferred to supers which are thoroughly scraped out inside. Having special marks on top-bars of grades simplifies the sorting greatly. Grading is done more or less rigidly according to the supply of combs of the most desired grades.

Only Best Combs in Brood-Chamber.

For brood-chambers we must have No. 1 combs. In 10 combs grading high as to drone-comb or open space one with more drone-comb at the outside is allowable, altho our deep space below bottom-bars provides a safety valve for drone-rearing. Bees always prefer dark combs. I cannot recall an exception to this rule. Place both light and dark combs in a second brood-chamber, and the queen will occupy the dark ones first. In a super, honey will be stored in dark combs first invariably. Put back light and dark combs for cleaning up after the extractor, and the bees will collect the honey from the light combs and store it in the dark ones. Where no disease is present dark combs which are not heavy with age are considered more valuable than light ones for all purposes. We produce fancy extracted honey for table use exclusively; we do not extract frequently to increase the crop at the expense of quality, but we do try to use the combs which the bees like best for all purposes.

We use a queen-excluder on every hive and prefer to use No. 1 dark combs in the supers, for reasons stated above. I mean the dark combs of light weight, not the old heavy ones which are on their way to the No. 4 class and the wax press. Since we have not enough No. 1 dark combs, we use next No. 1 light combs, then No. 2 combs, and finally, if driven to it, No. 3 combs. The main objection to combs of the third class is the fact that bees wishing to rear drones will refuse to store honey in drone-cells until badly crowded. This is a distinct detriment to the morale of the colony at a very important point in the season. There is nothing in the No. 2 combs which presents this objection. In fact, I cannot see that No. 2 dark combs are any less desirable for honey storage than No. 1's.

This matter of being able to classify our combs for different uses is a very important advantage we have in using only one size of frame. Just how it is to be accomplished with Jumbos in the brood-chamber and something else in the super remains to be seen.

Georgetown, Ont.

TRANSFERRING IN THE SOUTH

How an Expert Does It, and the Sure and Speedy Methods He Has Learned to Use

By E. R. Root

IN our last issue, page 77, I told how a bee-extension agent, C. L. Sams, of the Bureau of Entomology, Washington, D. C., and of the Department of Agriculture, Raleigh, N. C., is rapidly changing the old order of things into new—box-hive beekeeping into modern methods and equipment.

Government officials have stated that there are more bees per square mile, or certainly more apiaries, in the southeastern part of the United States than anywhere else in the country, and I believe this is true. But most of these bees are in box-hives, handled by the haphazard, happy-go-lucky methods that yield only a small fraction of the honey that it would be possible to secure by modern methods. We in the North are apt to think that the gums of the older days are a thing of the past. A trip thru the South will convince one that they are very much in evidence.

Because of this many northern beekeepers are going south and buying up bees; but when they do so, of course they have to transfer. There are good as well as decidedly poor ways of performing this operation. For the benefit of these and the old-timers in the Southland I shall try to show how an expert does it after having tried all the different ways. I refer, of course to C. L. Sams.

As I explained in our last issue, he usually announces that he will give a transferring demonstration at the home of some box-hive man. Sometimes the neighbors will bring their box hives over to these demonstrations. To do this, Mr. Sams instructs them how to slip the gum into a burlap sack and tie up the top. On occasions of this kind he will transfer several colonies, showing how simple and easy the trick is, and some weeks later he shows how these same bees in "patent gums" will outstrip everything else in the yard in old gums ten times over.

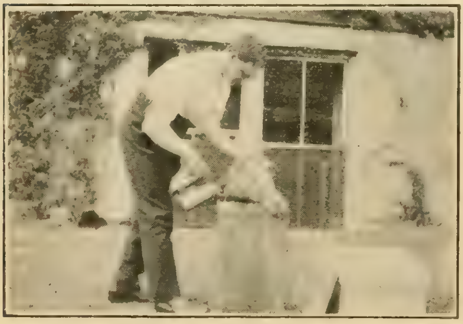


Fig. 1.—Smoking the bees in the box hive preparatory to transferring. The box hive is first turned upside down, and then the smoking is begun.

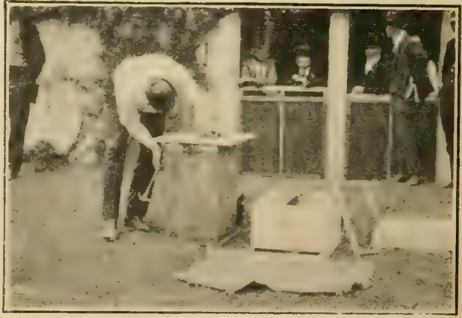


Fig. 2.—Drumming the bees out on to the super cover. This is done by a series of light blows kept up for three or four minutes on all four sides. The super cover or a board is much better than a box because it makes a tight fit.

I remember in particular how one old-time box-hive man told some two dozen other box-hivers who were present that his ''patent gums'' produced 150 pounds of honey each, and how he actually took all this honey without brimstoning and without getting a sting. That was an eye-opener.

How Sams Does It.

He selects a clear space on level ground, and asks the bystanders to form a circle around it. In the center of this inclosure he places the box hives or gums to be transferred, and modern hives each containing five or six frames of foundation. He turns the box hive upside down, blows smoke into the bottom, which is now the top (see Fig. 1). He then takes the super-cover or inner cover of the modern hive and sets it over the gum. He begins a vigorous drumming with a hammer—not heavy blows, but a series of light blows applied to all four sides of the old box or gum (see Fig. 2). This is kept up for perhaps three or four minutes. He next lifts the super cover slightly to see if the bees are clustering under it. If they have not come up yet to any extent he drums still more, after which he carefully lifts it with its adhering bees. This he gently sets over the hive, so that the cluster comes in the open space between the frames as shown in Fig. 4. The center frames are, of course, removed before this is done.

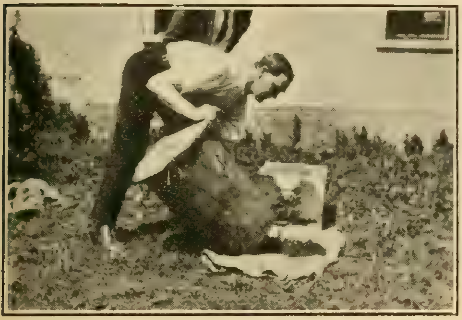


Fig. 3.—Another method of removing bees from a gum by dumping them on the ground with one sharp bump. This is not so satisfactory as the drumming method shown in Fig. 2.

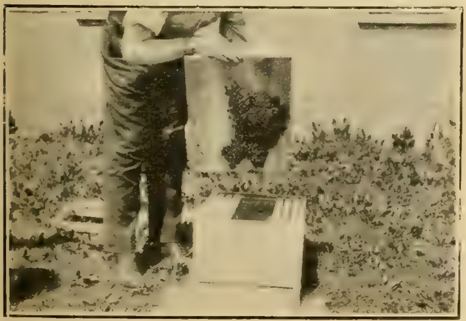


Fig. 4.—After drumming, the bees crawl upward and cluster on the super cover. This is gently placed on the new hive, after which the operation of transferring the combs begins.

If the drumming has been done properly, there will be left only a few bees clinging to the combs in the gum. Mr. Sams formerly used a box into which to drum the bees; but he says it is not always easy to find one of the right size. Moreover, he claims the super-cover is just as good, if not better, and, what is of considerable importance, it is right at hand.

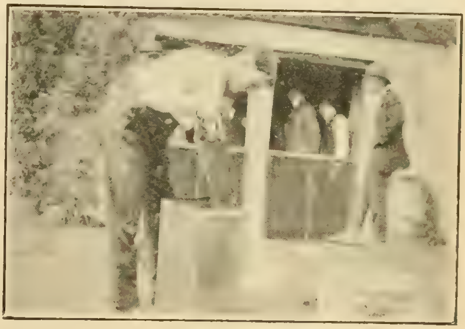


Fig. 5.—After the bees are drummed out, a common handsaw is altogether the best tool for cutting the combs away from the sides of the box.

The next step is to get the old combs out of the gum or box hive, especially those containing brood. For that purpose Mr. Sams says a common handsaw in the case of a box hive is altogether the best tool one can use (see Fig. 5). It is better than a knife, because it enables one to saw off the cross-sticks. A saw is better, also, because it cuts the combs better and cleaner than a knife, without breaking them.

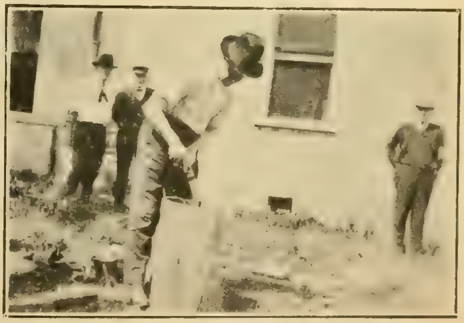


Fig. 6.—In the case of the round gums or logs, it is necessary to use a keyhole or narrow saw, which is run clear around the inside of the log, cutting the cross-sticks.

When transferring from a round gum or

log he uses a narrow-bladed saw. A keyhole or pruning saw is very good. This is run clear around the inside of the gum, cutting off the cross-sticks at the same time (see Fig. 6). After the combs have been cut loose, the box or gum is lifted off the combs, leaving them standing. With a long-bladed knife it is now perfectly simple to take out the pieces containing brood and fit them into the regular modern frames. All the other combs except those containing honey are dumped into a burlap sack. Those containing honey are retained by the family.

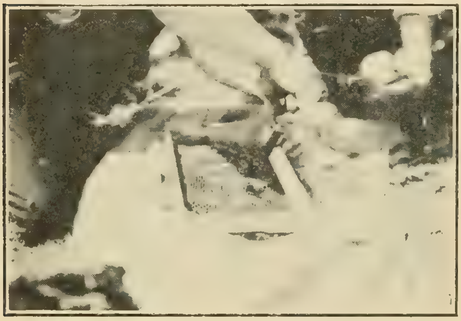


Fig. 7.—Only the combs containing the brood are fitted into brood-frames. A butcher-knife marks the size of the piece or pieces to be cut, and then the whole slice is cut large so as to fit snugly into the frame.

Perhaps nearly every one is familiar with the process of fitting pieces of comb into a frame. Only the squares containing brood are used. They are sliced up into sizes that will fit nicely together when the frame is laid over the whole and the size marked out with a knife as shown in Fig. 7. These squares are cut a little large, after which the frame is crowded over them. The last operation is to wind string around the frame as in Fig. 8, and tie. These frames of brood, as fast as they are made up, are then inserted in the space between the frames of foundation. Last of all, the box or gum is dumped in front of the entrance of the modern hive, when the work is complete.

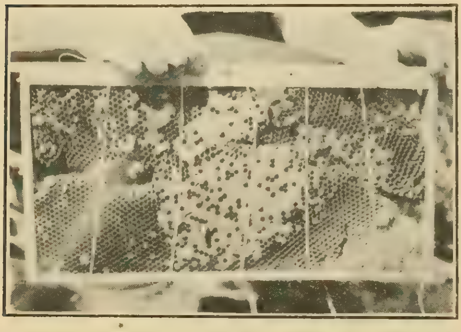


Fig. 8.—Where there are several pieces of comb it is necessary to use strings to hold them in place. These are wound around the frames several times and tied. The bees will remove the string.

Another plan, but one that is somewhat slower, is often used by Mr. Sams. A modern hive is prepared containing nine frames of foundation and a frame of brood from some other colony. This is placed on the stand occupied by the old hive or gum. On this is placed a bee-escape board with the escape feeding downward. The gum is turned upside down, when half of the bees are drummed up on to a super-cover or board, as before explained. In doing this it is important that the queen be secured. The bees with the queen are then dumped in front of the entrance of the new hive. If the queen goes in, all is well. The gum with the rest of its bees is now placed on top of the new hive with the bee-escape between. It is left that way for three weeks, when, if the queen was secured in the drumming, the brood will have emerged and most of the bees be below. The plan is shown in Fig. 10.

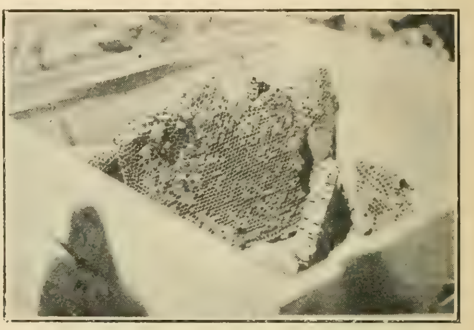


Fig. 9.—Sometimes one will find quite a large square of brood and fairly good combs in the old gum or box hive; but most of the brood comb in the box hives is irregular in shape, or contains too many drone-cells. Such as are here shown are better than the average.

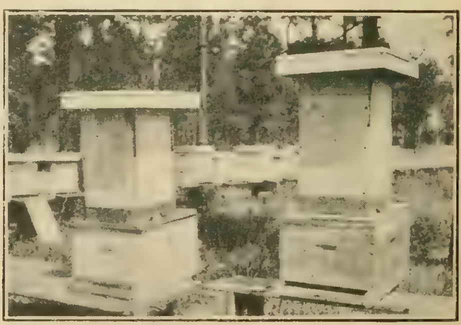


Fig. 10.—This picture shows a longer way of transferring, but it avoids the necessity of cutting and fitting combs of brood into frames. The objections to the plan are the difficulty of getting the queen into the new hive and the length of time required to complete the transfer.

The objection to this plan, says Mr. Sams, is the duration of three weeks of time; and if this is at the beginning of the honey flow, an extra super beneath is required. There is also the difficulty of getting the queen with the bees. If the queen is left above, housekeeping is liable to start over again upstairs. It takes skill and experience to drum out the queen with half the bees.

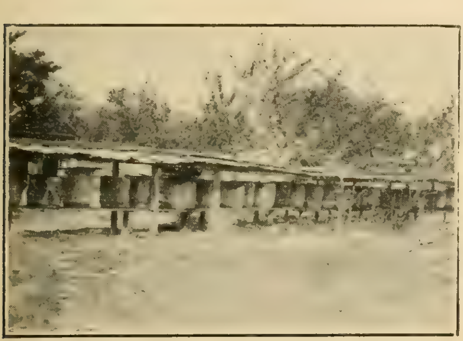


Fig. 11.—A characteristic log-gum apiary. There are several rows of these gums that were transferred by Mr. Sams. This is not at all a rare sight in the Southland.

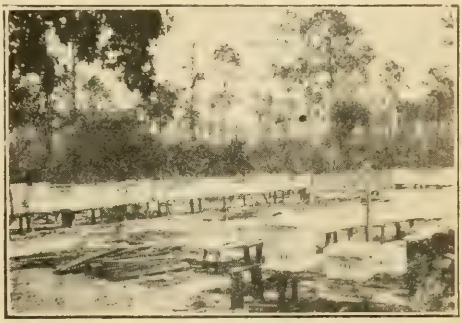


Fig. 12.—The same bees as shown in Fig. 11 after being transferred into modern hives. This is an apiary belonging to W. J. Martin. This apiary of 100 colonies, with the help of Mr. Sams, was easily transferred from the log gums in one week's time.

It should be explained that the entrance to the gum when placed on the new hive is closed, so that the bees must go downward in order to get outdoors. Of course all flying bees will be forced into the lower hive where they will have to stay when once down. The young bees will stay above to take care of the brood. After the brood have all emerged, the remaining bees that have not gone down are removed by the drumming process. This plan obviates the necessity of cutting and fastening into frames patches of brood, and, where the conditions are right, is ideal.

PAINT FOR BEEHIVES

Importance of Using Only High Grades of Paint. How to Interpret Formulas on Labels of Mixed Paint

By A. N. Clark

As paint materials of all kinds have been high in price for the past two years until quite recently, most beekeepers have put off painting. Now that the wholesale price of linseed oil has dropped over 50 per cent, and the price of turpentine has dropped still more, besides a heavy drop in prices of lead and zinc, which are the principal raw materials entering into the manufacture of the best white paints, we should naturally expect to purchase good ready-mixed paints at half the price of a year ago. However, such is not the case, as manufacturers are on Jan. 1 holding up the wholesale price around $3.50 per gallon and expect the retailer to pass along the high price to the consumer at around $4.50 to $5.00 per gallon retail.

On Jan. 1 raw linseed oil was quoted in New York at 80c per gallon wholesale, and turpentine at 75c. Both are cheaper than that now. The St. Louis market price of pig lead was down to $4.50 per 100 pounds, and zinc at $5.65. The present prices of raw materials would warrant a retail price of not to exceed $3.00 per gallon for the very best mixed paints. About the only way to avoid paying tribute to paint profiteers would seem to be to mix your own paints out of such materials as you can purchase at reasonable prices. If white lead and zinc white in paste form can not be purchased at a satisfactory price, the farmers' old reliable red-barn paint, made of a good quality of Venetian red, raw linseed oil, and turpentine, mixed by the user, is a very durable paint, and has good hiding power. It is very satisfactory on chaff hives and on single-wall hives that are fairly well shaded from the sun, but is too warm for sun-exposed hives. In ordinary times under ordinary circumstances it is the best economy to use the best white paint for single-wall hives.

What Constitutes a Good Paint.

The requisites of a high-grade paint are: Durability, leaving a good surface for repainting, hiding power or opaqueness, spreading capacity, and failing only by gradual wear.

White lead has great hiding powers, but when used alone chalks off as dust. When used with zinc white the combination is more durable than either lead or zinc alone. Zinc white used alone is apt to peal off. Raw linseed oil, as the vehicle of a paint mixture, leaves a good surface for repainting. Pure old process white lead to the extent of 65 per cent and good zinc white 35 per cent, mixed in pure raw linseed oil, plus a little turpentine drier, make a paint that fulfills all the above requisites of a good paint.

A hive painted with such a paint should not need repainting under five years if the first painting was well done, and will remain in pretty good condition for seven to ten years in most climates.

I would never use for outside painting a paint in which any present-known substitute for raw linseed oil is used, except in asphalt and tar paints. Asphalt makes a good coating for bottom-boards of hives. It can be applied by dipping in a kettle of hot melted asphalt, or can be melted and mixed with kerosene, or dissolved cold with gasoline, and brushed on. It also makes a good coating for sheet iron where the black color is not objectionable. Many corrugated-iron buildings are coated with asphalt paint.

Even a good paint may fail in durability if applied to damp, green, pitchy, or very cold lumber. Paint can not be properly spread in a cold atmosphere without undue thinning. Knots should be coated with shellac dissolved in denatured alcohol before applying paint.

In applying the priming coat to a pitchy lumber like hard pine, it is good practice to add considerable turpentine.

Poor Paint Dear at Any Price.

This will be a year in which beekeepers will be tempted to buy extremely poor-quality mixed paints, which may be offered at prices a little below the best. Many of these poor paints are dear at any price.

Some of the adulterants for linseed oil are soy-bean oil, corn oil, rosin oil, fish oils, coal oils, and benzol. None of them are good drying oils like linseed oil. By the word "drying," as applied to paint oils, we mean oxidation and not evaporation. Raw linseed oil absorbs over one-third of its weight of oxygen in drying.

Some of the "fillers" and adulterants used in white paints are calcium carbonate in some form, barytes, calcium sulphate, magnesium silicate, China clay, and powdered sand.

Read the Label on the Can.

Don't buy a mixed paint unless the label on the can contains the name of the manufacturer and the formula. Some state laws require this; so, if the manufacturer omits either, it is good evidence that he is not proud of his product.

Some people do not understand the meaning of paint formulae as printed on paint labels, so we give a few here with our criticism of the same:

Formula 1. Pigment: 65 per cent old process white lead, 35 per cent zinc oxide. Vehicle; 93 per cent pure raw linseed oil, 7 per cent turpentine drier.

The above represents to my mind the best white paint for outside work.

Formula 2. Pigment: 66.6 per cent white lead (lead carb.), 33.4 per cent zinc white (zinc oxide). Vehicle: 84.8 per cent raw linseed oil, 5.7 per cent Japan drier, 9.5 per cent turpentine.

No. 2 is manufactured by an old paint company that takes pride in its reputation. It is a very good paint. Covers well and spreads well. Dries a little too fast for warm-weather work, as it contains a rather large amount of drier and turpentine.

Formula 3. Pigment: 25 per cent white lead (lead carb.), 20 per cent sublimed white lead (lead sulphate), 30 per cent zinc oxide, 10 per cent calcium carbonate, 15 per cent barium sulphate. Vehicle: 80 per cent raw linseed oil, 5 per cent turpentine, 5 per cent Japan drier, 7 per cent benzine, 3 per cent water.

No. 3 is probably somewhere near an average quality of mixed paint. It is neither very good nor very bad. The pigment contains some sublimed lead, which is not considered as good as lead carbonate. It also has 25 per cent of inert filler, as calcium carbonate and barium sulphate. The worst feature is the 7 per cent benzine and the 3 per cent water in the vehicle, used to adulterate the linseed oil.

Formula 4. Pigment: 36.6 per cent sublimed white lead, 12.2 per cent zinc oxide, 34.2 per cent calcium carbonate, 9.7 per cent barium sulphate, 7.3 per cent magnesium silicate. Vehicle: 87 per cent linseed oil, 6.8 per cent naphtha drier, 6.2 per cent naphtha.

No. 4 is made and sold by a general jobbing house. It contains no lead carbonate, only sublimed lead, and only a small amount of zinc oxide. Over half of the pigment is a cheap "filler," of which 34.2 per cent is calcium carbonate, or whiting. The vehicle contains too much naphtha. (Naphtha is cheaper than Japan drier and turpentine.) The paint lacks covering or hiding power—is too transparent. It also requires more gallons to cover a given surface, owing to lack of spreading capacity. No. 4 is manufacturer's analysis.

Formula 5. Pigment: 10 per cent sublimed white lead, 10 per cent China clay, 60 per cent barium sulphate, 10 per cent calcium carbonate, 10 per cent silica (sand). The vehicle is a mixture of linseed oil, soybean oil, naphtha drier, and water.

No. 5 represents a very poor paint. A large amount of barium sulphate was probably used to give it weight. It contains but little linseed oil and dries very slowly.

All ready-mixed paints require some thinning with raw linseed oil and turpentine for first coat.

Charlotte, Mich.

WORKERS FOR THE HONEY FLOW

A Few Simple Requirements Which Greatly Increase the Strength of Colonies

By H. F. Wilson

BEEKEEPERS in the North are soon to face the problem of getting the bees in shape for the 1921 honey crop. Very few beekeepers realize the factor of success involved in just the right care of bees from March to June. They feel that if the bees come thru the winter successfully, they have done their best and that success or failure depends upon the season to follow. But what of the one or two beekeepers in the neighborhood who secure a part of a crop altho all others failed? Did the successful ones give the bees the needed care in the spring?

It is so easy to do and the results are so well known among practical beekeepers that it is sometimes hard to understand why 90 per cent of our beekeepers simply set the bees out-of-doors in the spring and leave them without protection and without sufficient stores to build up as best they can. It is my belief that protection and a superabundance of stores are fully as important in the spring as during the winter—and perhaps more so.

During the winter the temperature surrounding the cluster will be held at 57 degrees F. as long as the bees have stores and energy to live, regardless of the cold outside. During that time the temperature may go below the zero point for a short period at a time, but it will range mostly 20 degrees F. or higher. The bees are then required only to produce heat to raise the temperature 30 to 50 degrees F. In addition, they are not at that time required to use energy in the production of wax and food for the young.

Value of Spring Protection.

As soon as brood-rearing starts in the spring the temperature inside the cluster and around the young brood is increased to 93 to 95 degrees Fahrenheit. At the same time the outside temperature will in the North run about 30 degrees F., with fluctuations during March and April up to 65 degrees F. Under these conditions the bees are forced to produce energy which will keep the temperature up to that required for brood-rearing, a difference of 30 to 60 degrees. During that time an excess of energy is also being used in producing larval food, and possibly other products.

A practical illustration of how temperature influences the development of brood in the spring may be demonstrated by watching three types of colonies, those of minimum, medium, and maximum strength. By May the weak colony will have only a small circle of brood, indicating the inside space covered by the cluster. This will be more or less true also of the medium colony, but the area of the brood-nest will extend beyond the ordinary winter clustering space. In the strong colony the brood-nest will be several times larger than the winter clustering space and several frames may be filled from end to end.

It is, of course, a recognized fact that strong colonies in the spring are able to build up strong for the honey flow, but how many beekeepers have ever carried on trials with protected and unprotected colonies with extra space for breeding and with more stores than seemed necessary? When a demonstration of this nature is carried on it is truly remarkable, and this is the principal reason why beekeepers who have tried packing the bees out-of-doors have reached the conclusion that outdoor packing is better than cellar wintering. However, the cellar wintering was not at fault, but the fact that the bees wintered out-of-doors had spring protection made it appear so. In the northern States the bees are often removed from the cellar and placed in exposed locations where the north and west winds sweep over them, causing a loss of heat which can only be made up by extra work on the part of the bees and a consequent loss of energy which should be conserved for a greater expansion of the brood-nest. Whenever a cold, wet spring occurs the bees have great difficulty in building up and always reach the honey flow in poor condition unless protected. The bees may be set out to advantage as soon as the snow is off the ground if they are given protection. There is considerable evidence to show that too much packing in the spring is detrimental as in heavy winter packing. If the packing is too heavy, the heat of the sun does not penetrate to the hive, and the bees do not come out and fly during the few days that are warm enough for a flight.

The Necessity of an Abundance of Stores.

Here in Wisconsin the month of April is always cold and the night temperatures frequently drop to near the freezing point. Perhaps there are only a few days when the bees can fly, and in that case we say that the bees being unable to gather pollen and nectar could not build up. This may be true in many cases, but it would not be the case if the beekeeper would only provide abundant stores. In truth, the bees do not need to fly more than three or four times during the latter part of March and April, and conditions without the hive have little or no effect on the development of the brood if conditions are right within.

Room Needed for Full Development.

Some of the beekepers in Wisconsin who have been content with one hive-body full of bees at the beginning of the honey flow, have, during the past two years, been amazed to find that they could get two 10-frame hive-bodies full and from 12 to 17 frames with brood. Two beekeepers in late May, 1920, actually had two 10-frame hive-bodies with more bees than could get into the hive. No wonder some of our experienced beekeepers want large hives.

We do not put two hive-bodies on when the bees are first set out, but wait until six or eight frames contain brood when the second hive-body is placed on top. As soon as the queen lacks room below, she goes up, if the upper hive-body is packed and warm. In spite of evidence to the contrary, she will go down again when everything is filled above.

Our recommendations for the spring of 1921 are: First, arrange to set the bees in a location where they will positively be protected from the direct influence of the wind by providing some kind of windbreak. Second, if the largest possible colonies are desired at the beginning of the honey flow, pack every colony with some outside covering or packing as soon as the bees are put on their summer stands. Third, see that every colony has more stores than **you think** it can use during April and May. If you do not have combs of honey feed sugar syrup and give 40-50 pounds because, as a rule, 10-20 pounds is about half enough. The strongest colonies will need from 75 to 100 pounds of stores to build up to the greatest possible strength, and, if they canot get it in the field, the beekeeper must supply it. Fourth, let the bees have room for breeding. The beekeeper who has swarms in May should not be proud of the fact, for it is a sure sign of bad beekeeping. The fundamentals of spring care to get large colonies at the time of the honey flow are bees to begin with, protection during April and May, superabundance of stores, and not less than two hive-bodies for spring-rearing.

Madison, Wis.

BEEKEEPING IN FOREIGN LANDS

Interesting Facts About Apiculture in Happy Little Costa Rica

By W. B. Schrels

CONDITIONS for beekeeping vary as much with locality in the tropics as they do in the temperate zones, and more so. Except for a few general rules and principles the beekeeper has to find out for himself what is best for his locality. Here on the west coast of Costa Rica we have an interrupted honey flow that lasts six to seven months, and we requeen all our colonies that have old queens or queens that have been laying over two months, with young queens that are just beginning to lay. Even then many queens fail with us before the honey flow terminates. This causes a great loss, as the strength of such colonies in the height of the honey flow dwindles quickly.

The bees instead of superseding the failing queen often just fill the brood-nest full of honey, the queen failing so quickly that the bees evidently do not become aware of her condition until no worker eggs are available from which to rear a queen. These colonies, with a brood-nest full of honey and few bees to defend it, are an attraction for robbers at the end of the honey flow, and a source of annoyance.

The average life of a queen here during the honey flow is about six months or perhaps a little less. Queens reared in the cooler higher altitudes live very little longer when brought here to the coast, while if left in the higher altitude where the honey flows are short they live up to three years and over.

There are no other bees of the European variety within many miles of my apiaries. The first year after I came here I had my apiary on a peninsula almost surrounded by the sea, and that year I lost about 60 per cent of my young queens in mating. Evidently they fell into the salt water, and about 40 per cent of those that did return proved either drone-layers or partly drone-layers. The second year I moved my bees on to the main land, and had very little loss in mating. The percentage of drone-layers also decreased some. This (the third) year the percentage of drone-layers has decreased still more.

Long Swarming Season.

Swarm control is also a vexatious problem with us. This year our bees swarmed for seven months, not more than one or two swarms a day, and very few colonies cast a second or after-swarm. Requeening with young queens reduces swarming some, and so does extracting. But you can not extract always in time; sometimes the supers are full of honey and you have to wait a week or two for it to ripen and the bees to cap it. To put on another empty super or to scatter the brood seems to hasten their swarming impulse. The size of a hive seems to make absolutely no difference in the amount of swarming here. We use the standard 10-frame L. size two and three-story hive. Usually when a colony swarms we cut out all the queen-cells and stubs and return the swarm to the old hive, and in nine cases out of ten they stay put.

The Honey Plants.

To name the best honey plants of this

locality would be very difficult. Providence was so kind and nature so lavish that a botanist would despair in trying to list and classify and find correct names for all of the nectar-secreting plants. I have been here three years, and each year our main honey crop came from a different source. Almonds, citrus fruits, a number of varieties of plums, tarmarinds, aguacates, cocoanuts and many other varieties of palms, cotton, mesquite, catclaw, and many vine plants, both wild and ornamental, a great variety of tropical fruits, as well as nearly all the lumber woods, cedar, mahogany, cocobolas, mora, genisaro, espavel, balsa, and many others, also varieties of mint, sage, goldenrod, and wild sunflowers all produce honey. I have planted buckwheat and Russian sunflowers in the rainy season, and the bees worked busily on both. To pluck a flower from a tree or vine seldom causes it to stop secreting nectar. I have often noticed bees busily at work on the fallen flowers on the ground under a tree; and just the other day a young lady pinned some orange blossoms on, and some time afterwards two bees came and seemingly got honey out of the blossoms.

Hauling drums (iron casks) of honey on ox carts to a boat landing in Costa Rica.

There are five or six varieties of mangrove, some of which bloom for six months, and the bees get considerable honey from them at times. Some times of the year there seems to be a dearth of pollen, and we have planted corn and kaffir corn to produce pollen at these periods.

Our honey flow begins with the dry season, and we seldom have a shower of rain for six months or over. This gives us ideal extracting weather. With the first rain in April or May the flow decreases, and the honey gets slightly thinner and darker in color, and after the first of June the bees usually find only enough honey for their own use. Last year was an exception, as we secured quite a little surplus in July from wild sunflower.

Critical Period for Bees.

October is the most critical time for the beekeeper in western Costa Rica. The bees then usually begin to rear brood heavily. Just before the dry season a wet spell sets in that lasts from 30 to 60 days, and very seldom do the bees get a flight of more than an hour. In this kind of weather they can gather neither honey nor pollen, and we have practiced feeding to great advantage the past two years during October. We have fed both white and dark brown sugar by making it into a thin syrup and pouring this into empty combs. The bees seemingly take one as readily as the other. I am satisfied that we materially increase our honey crop thru feeding at this time.

Many Varieties of Native Bees.

There are many kinds of native bees in this locality, both the stinging and stingless varieties. Some build wax combs; others, half wax and part woody fiber; still others build all fiber nests, something like a wasp's or hornet's nest; some have a nest full of little wax cells or capsules like birds' eggs filled with honey. In size these bees also vary greatly, some being tiny little things, while other kinds are larger than the European bee. The honey of one very small kind called maria seco by the Costa Ricans is sold and highly esteemed for medicinal purposes.

Some of the larger stingless varieties gather as much as 12 or 15 pounds per colony in a season. The method practiced in securing the honey is very crude. Usually a man twists and jams an old stick or iron hook around in the log gum from one end, catching the honey, wax, and brood in a gourd as they drop from the hive. When the honey is clean it often has a very fine distinct flavor, some of it tasting as if it were flavored with vanilla extract. Two of the smaller varieties of native bees we have named robber bees because they always pounce into the hives of our bees to steal honey when we are extracting or working. I have never seen them rob out a colony, but they worry the bees considerably.

Average Yields.

We have made many mistakes since we came here, and have also learned much. We have increased the 6 colonies that we brought with us to 600 and have also sold some. Our crop will average almost 300 pounds per colony this year, figuring our stock at the beginning of the season; if we figure in all the increase, it reduces the average to a little less than 100 pounds.

Our stock came originally from The A. I. Root Company queens from their home yards, having been bought about six years ago. When we first came here honey was sold only in drug stores; but we have worked up a good local demand, and the largest wholesale store in Punta Arenas now keeps our honey in stock.

Punta Arenas, Costa Rica.

COMB HONEY PRODUCTION

How to Have Brood-Chambers Well Filled with Brood at the Beginning of the Honey Flow

By Geo. S. Demuth

IN the February issue on page 80 is a brief discussion of a time-honored problem in comb-honey production, that of having the brood-chamber almost completely filled with brood at the beginning of the honey flow, so that there is neither much sealed honey left in the hive nor many empty cells in which the bees can begin storing within the brood-chamber when the honey flow begins. This highly desirable condition in all, or nearly all, of the colonies at just the right time is not easily attained, and too often only a small percentage of them happen to be just right in this respect when the honey flow begins; for it means that just at the beginning of the honey flow the colonies must have consumed practically all of the honey that had been stored within the brood-chamber for winter and spring, and at the same time must reach their maximum in brood-rearing. Colonies that happen to be in this condition just at the right time are usually the ones which work in the supers with the greatest energy and give the least trouble from swarming. To find the proper size for a brood-chamber that would hold just enough honey to carry the colony up to the beginning of the honey flow (at which time the honey should be practically all used up and the combs of the brood-chamber almost completely filled with brood) has been the dream of comb-honey producers for years. But the great variation in the way the bees come thru the winter, the variation in the amount of honey stored previous to the main honey flow from minor sources, and the variation in the time of the beginning of the honey flow have prevented the attainment of this goal.

Experiments by Quinby and Langstroth.

Before the advent of the modern beehive Quinby, after having experimented with box hives of various sizes, wrote in regard to this in 1853 as follows: ''I am satisfied that 2,000 inches in the clear is the proper size for safety in this section and consequently for profit.'' Strangely enough at the same time this was penned, Langstroth, working independently and without knowledge of Quinby's experiments, had already decided to build his new movable-comb hive to hold 10 Langstroth frames, it thus containing, when allowance is made for the frames and the spaces around them, almost exactly 2,000 cubic inches.

It must be remembered that these two great masters were trying to find the best capacity for the brood-chamber for the production of box honey, for the extractor had not yet been invented.

After 68 years and after having departed greatly from the recommendation of Quinby and Langstroth, comb-honey producers now generally admit that this size is about as near the long-sought goal as any yet tried, being smaller than that needed by the most prolific queens and best colonies and larger than is needed by others. In other words, under good management, as the seasons run, it is not far from the average size that will be well filled with brood at the beginning of the honey flow; but this does not take care of the better colonies which need more room for brood-rearing in the spring and does not bring good results for those colonies which do not fill these brood-chambers with brood.

As was pointed out in the last issue of this journal, the attempt to bring about the condition of brood-chambers that are honeyless but filled with brood in all of the colonies at the beginning of the honey flow, by reducing the size of the brood-chamber, almost resulted in ''killing the goose that laid the golden egg.''

At the present time the solution of this problem is being sought in exactly the opposite direction, that of increasing the size of the brood-chamber beyond the capacity of the most prolific queens so that there is still room for enough honey for safety, then reducing to normal when the honey flow begins, thus approximating the methods which prove so successful in extracted-honey production.

Langstroth Depth for Comb Honey.

Whatever the defects in the standard Langstroth hive, as now made, for extracted-honey production there is a general agreement among comb-honey producers that this hive is well adapted for comb-honey production. It was originally designed by Langstroth as a box-honey hive and most of the improvements that have been made since have been to perfect it as a comb-honey hive.

If combs shallower than the Langstroth are used, the bees usually build up less rapidly in the spring, and in some locations shallower combs result in considerable pollen being stored in the sections. If combs much deeper than the Langstroth are used, it is more difficult to induce brood-rearing to the top-bar, thus resulting in the objectionable rim of honey in the upper portion of the brood-chamber.

Two-Story 8-frame Hives.

Many comb-honey producers who have an equipment of 8-frame hives use two stories previous to the honey flow, to provide sufficient room for extra stores and brood-rearing, permitting the queen the free range of both stories. When the honey flow begins these are reduced to a single story by taking away most of the honey and leaving most of the brood. At the same time two comb-honey supers are usually given so that the total hive capacity is not reduced. The combs that were removed (which may contain considerable honey and brood) are then given to other colonies, which need not be strong and which are not used for comb-honey production, where they are to be refilled with honey as the brood emerges, then put back upon the hives again after the comb honey supers have been removed at the close of the season. The hive-bodies containing the combs that were removed may be piled six or seven high on top of weaker colonies. These ''piles'' soon become powerful colonies because of the large amount of emerging brood. While this involves considerable labor it puts the colonies in excellent condition to begin work immediately in the comb-honey supers.

It is open to the objection that the 16 combs must be sorted, and it is sometimes necessary in this sorting to leave some of the combs which have a rim of sealed honey in the upper portion, these being combs from the upper hive-body. The plan is an excellent one, however, and may be used even with the 10-frame hive.

Separate Chamber for Honey.

To bring about similar results with less labor some comb-honey producers who use the 10-frame hive have provided a shallow extracting super for each colony. The shallow extracting supers contain the extra stores needed for safety during the spring, thus permitting the standard brood-chamber to be used almost entirely for brood. They are taken off at the beginning of the honey flow when the comb-honey supers are given. In this way, the objectionable barrier of honey at the top of the hive is removed; and the comb-honey supers are placed down adjacent to the brood, which is a great advantage in stimulating the bees to expand their work into the supers and in reducing the tendency to swarm. This principle has been recommended by several extensive beekeepers even when extracted honey is being produced.

If the combs in the brood-chamber are uniformly good, having all-worker cells to the top-bar and only the few drone-cells usually present in the lower corners, 10 standard frames will hold nearly all the brood that a prolific queen is able to produce under the most favorable conditions, since they are practically free from honey and the brood extends to the top-bars. These food chambers can not well be tiered up above the comb-honey supers and left on the hives during the season, as in extracted-honey production, on account of the darkened cappings of the honey in the sections when brood-combs are placed above them. They must be taken off and tiered up on weak colonies which are not being used for comb-honey production, for they should be refilled with honey as the small amount of brood which they usually contain emerges. After they have been filled with honey these food chambers are ready to be given back to the colonies when the crop of comb honey has been removed from the hives.

The extra stores provided by either of these plans apparently stimulate the bees to rear a large amount of brood during the spring, usually resulting in at least one standard brood-chamber being well filled with brood at the beginning of the honey flow and colonies so strong that they begin work in the supers with a rush.

Thus by using a separate chamber for honey and a brood-chamber slightly smaller than the capacity of good queens, the safety of the colonies, so far as stores are concerned, is insured without laborious and expensive feeding which is too often not done when most needed; and, at the same time, the objectionable rim of honey at the top of the hive can be lifted off and the comb-honey supers placed upon a brood-chamber almost full of brood and practically free from honey.

Where honey granulates readily the large surplus of stores may sometimes be objectionable, but where honey granulates readily comb-honey production is not advisable anyway. Colonies so provisioned are usually built up so strong in the spring that most of the extra honey may be used up and the combs in the food chamber refilled with honey from early sources.

FROM THE FIELD OF EXPERIENCE

NATIONAL HONEY ADVERTISING

Campaign Proposed to Boom Honey. How to Raise Ample Funds

Advertising is the means by which an article is made conspicuous in the public eye. This same medium clarifies the vision of the multitudes as to whether the article in question is a necessity, an acquisition, or a luxury. There are numerous foodstuffs that have lain dormant or buried, so to speak, for decades and have been suddenly brought into prominence thru the channels of advertising. This is exactly the procedure that should be applied to honey. Too long has it been regarded as a supernumerary commodity. It is just about time that the beekeepers of America resurrect the fruits of their labor and pedestal honey on its rightful sphere. Instead of being utilized scantily in a few homes as a dainty luxury it should be used freely in every household in many forms of cooking, as a substitute for sugar, and most of all, because it is a natural, wholesome, and healthful sweet, and a big energy-producer. Again, it should by all means be administered freely to children, thus satisfying their desires for sweets and at the same time weaning them away from the unwholesome candies that flood the markets of today. Let us producers face the facts, and proclaim these facts, that honey is truly a wonderful product and, as a sweet, stands without a peer.

Our product, if properly marketed, commands a fair price at the present time. Our recent war and the excessive foreign demand are directly responsible for the stability in prices for the past few years, but this same foreign demand is decidedly on the decline right now and is daily dwindling. If conditions go back to the old levels, what will be the results? There is but one conclusion — prices will naturally decline along with the demand. There can be but one recourse, and that is to stimulate the demand within our own boundaries. Allow me to emphasize the fact, that this condition can be brought about by means of intelligent and well-directed advertising. The San Francisco Bulletin, under date of April 29, 1920, said:

> "SAN FRANCISCO FIRM SELLS HUGE QUANTITY OF RAISINS.
>
> "The increased consumption of raisins in this State is remarkable, according to figures submitted by the O'Malley-Collins Company of San Francisco, which sold 20,000,000 pounds of raisins in 1919. The increased consumption of raisins in the United States is marvelous. In 1911 there was harvested in California a total tonnage of 70,000 tons, and even this small tonnage appeared to be practically a drug on the market. At that time raisins were sold in a small way by the grocers, around holiday time, and utilized by a few bakers. The growers were losing money, and each year found them further in debt. It was for this reason that the growers amalgamated and formed the California Associated Raisin Company, in hope of saving the industry. At the start it did not look as tho the new association was going to be successful. However, by hard work and constant advertising, they managed to convince the public of the enormous food value of the raisin. The bakers gradually realized that, no matter how good a product they produced in the line of bread or buns, raisins made it better, with the natural result that there is not a bakeshop of any consequence in northern California that does not today make a specialty of baking raisin bread, raisin buns, and pies. Where a retail grocer in 1911 sold one package of raisins, he is today selling five packages, showing that the demand from the housewife has also increased proportionally. During the year 1919 190,000 tons were produced."

Now, the question arises, how can ample funds be raised to finance a national advertising campaign on honey? Such an undertaking would be extremely simple and intensely successful, if it could receive the unselfish support of all the beekeepers thruout the United States. As a suggestion and as a means of raising the necessary funds, supposing every beekeeper would contribute to the national fund a minimum sum of five cents and maximum of ten cents for every colony of bees that he owned or operated. Thus, the owner of a hundred stands would donate not less than five or more than ten dollars for his proportion of the benefits that would be derived under the campaign.

I am prone to believe that every progressive beekeeper of our land would unhesitatingly come to the front and substantially support such an important work. The results would be far-reaching, and we can conservatively estimate that such a campaign, properly directed, would double or even treble the present demand.

There can be no reason why the above outlined adventure would not be a complete success, and every producer that sold a pound of honey would be the beneficiary. This idea is open to comment and further suggestions. Let us hear from the beekeeping fraternity at large and see if it is not possible, collectively, to take our product off the obscure shelf.

Yerington, Nev. Truxton V. Damon.

COLOR OF DRONES

Drones from Imported Queens More Uniform than from American-Bred Queens

In 1871, in conjunction with Rev. H. A. King of New York City, I imported some Italian queens from Italy. It is my recollection that the drones from those queens were uniform in coloring. They did not have three yellow bands such as workers have; but their bands, while yellow, were uniformly clouded. One drone was as much a duplicate of another as one worker of another. It does not seem to be so today.

About two years ago I bought a breeding queen of one of our leading queen-breeders. Last year she proved a good queen, so this past spring I prepared to use her for requeening my yard. Her worker bees were uniformly marked. I could see no indication of an intermixture of foreign blood. However, when the drones began to appear I was astonished to find a great difference between them, the color varying from that of the typical yellowish Italian drone to one without a hint of yellow upon it, being instead a solid, shining, metallic black. There were more black than yellow drones in the hive. I discarded the queen as a breeder.

Shortly after this, in company with Frank Aten (whom some of the readers of this magazine will remember as a Texas queen-breeder) and a number of other beekeepers, I visited the apiary of one of the leading beekeepers of Travis County. He tried to maintain the purity of his Italians as a whole, but he had one colony of which he was particularly proud. The bees were as uniformly marked, and, in appearance, identical with the bees of my colony above referred to. So were the drones. Most of them were shining, metalic black. I called attention to the fact and was informed by several beekeepers present that this is not at all unusual, and that there is no uniformity in the marking or coloring of drones.

Returning with Mr. Aten, I asked him privately for his observations. He replied: "When I was in the bee business several years ago, I imported hundreds of queens from Italy; and my recollection of the drones tallies with yours, that all drones showed yellow and were quite uniformly tho not so clearly marked as the workers." I am quite sure of the accuracy of my recollection. I raised a good many queens from the imported mothers referred to and do not recollect having seen a black drone among the offspring of the purely mated queens.

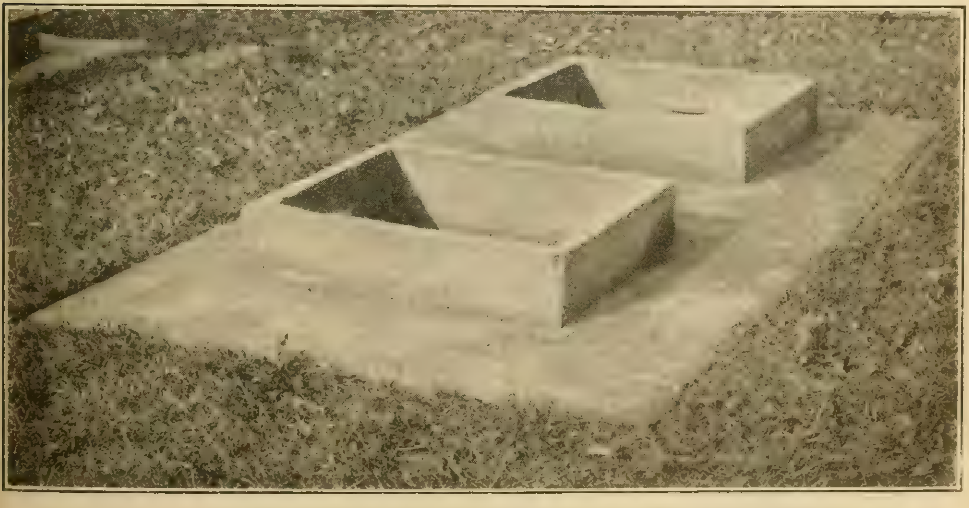
Austin, Texas. E. P. Stiles.

CONCRETE HIVE-STANDS

Their Many Advantages Described by a Beekeeper of Long Experience

I am sending two views that show a part of our home apiary, which contains 132 hives with concrete stands for the same number, and one view of our concrete hive-stand at close view.

The hives are the double-walled ten-frame Jumbo, and when the photo was taken they were ready for winter. After 35 or more years' experience with other sizes of hives and other modes of preparation for winter and of management in general, I find that these are by long odds to be preferred. Material for these concrete hive-stands is cheaper than that for any other satisfactory hive-stand, but the labor, of course, is more. In the end, however, labor is saved; for they remain level, stay in their places, and will not rot. Grass and weeds cannot grow up between and around the hives, and the apiary



A close-up view of one of Mr. Chrysler's concrete hive-stands, which he says give excellent satisfaction for several reasons.

can be kept in order with a scythe or lawnmower without bumping the hives. One sack of cement is sufficient for four hive-stands, with gravel in proportion of four to one.

The concrete is placed on top of the ground; no digging is necessary, but the ground should be solid and level. The thickness at the outer edge of the concrete is one to one and a half inches and increases to two inches at the upright rim, which is six inches high above the ground. I have found that reinforcing is not necessary.

W. A. Chrysler.

Chatham, Ontario, Canada.

WASHBOARD ACTIONS OF BEES

Method Employed by Young Bees to Work Off Surplus Nervous Energy

As early as my first year in beekeeping I first noted those peculiar actions of bees when they are apparently busy over the washboard doing the colony-wash. They roused my curiosity, as they do with everyone else who has any eyes for the study of our pets. After some thought I formed a theory and ever since that time have been subjecting that theory to the test of cross-examination. It stills holds with me, and I shall offer it to the readers of Gleanings. Possibly someone will knock a hole in it and thus help me to disprove the theory if it be unsound.

The theory is this—the bees are simply working off an excess of energy. If one will subject these actions of the bees to a careful analysis, he will perhaps follow the lines of observation and deduction which I will now take.

The most careful scrutiny fails to note that the bees engaged in this activity are accomplishing anything tangible. If one could detect that they had some substance in their mandibles or on their tongues, or could feel assured that their stomachs were filled with other than what an idle bee usually has in its stomach, then it would be possible to make a start towards an explanation. No such opportunity is present, and we are forced now to investigate along some other lines.

First let us ask, "Is this action more prevalent at some times than others?" My answer to this question is, "Yes, these peculiar actions are rarely seen except in times of comparative idleness—times when the flowers are furnishing but little for bees to gather. Here the actions appear most noticeable in August, tho isolated instances appear in other warm months." Then let this question come, "Do bees of a particular age take part, or is the action peculiar to bees of all ages?" My answer is, "Old bees never do this, and very young bees never do it. Only bees of the age of two or three weeks perform this action. Bees that have passed the nurse-bee stage and have had their cleansing flight, bees that are comb-builders are the washers."

Next let us seek analogous actions. The captive lion or the caged bear will for hours keep up a ceaseless shuffle from one end of his cage to the other. The captive giraffe will for hours mark time with his feet. Now if these animals were free they would be roaming the plain or the forest. Their active muscles are permeated with nerve fibers which keep up a constant call upon those muscle fibers to exercise. Will he, nill he, the poor animal must restlessly contract and relax those muscles.

We ourselves show the same tendency.

The Chrysler apiary with concrete hive-stands,

FROM THE FIELD OF EXPERIENCE

Children kept too long in their seats at school soon arrive at a condition that demands a chance to use the muscles. Travelers at sea will for long stretches of time walk the decks. Sometimes this is done from sense of duty, but more often it is done because of irresistible nervous impulse. After one or two turns their scenery becomes about as varied as does that of the caged tiger, but they keep on walking.

If I am right in interpreting the age of these bees, namely, that they are of the wax-working age, what should we expect of such bees? Little honey is coming in. No comb need be built. There are thousands of workers, and there is but little of their specified work. The muscles in their bodies which most nervously call for action are those concerned in the making of comb. The poor bees cannot keep still, the hive is hot, they have no inclination to fly, they crowd out of the hive in ranks and keep up a ceaseless making of ghost-comb on the alighting-board and the wall of the hive.

Why the worker bees in question take just that form of working off their surplus nervous energy would be a difficult thing to assert with confidence. It might be suggested that this method is a safe and sane one, and fulfils every requirement. It surely is safer than a general flight would be. If bees roamed in idle flight many would be caught by birds, others by insects, others be lost by various means.

It is always safe to say that bees, whatever they do, are doing what their ancestors have done from remote times. Doing thus they have survived the vicissitudes of countless centuries of active life with all its dangers. Who knows how many hapless colonies have gone into extinction because they departed from the beaten path? Who knows how many side paths in all those years have been ventured upon, some with disaster, others with success? No one knows, of course, but we all know that the bees are here still at their old job. It would not be a foolish thing to assert that possibly the very existence of the honeybee rests upon the fact that in some remote age worker bees of certain ages formed the washboard habit.

Norwich, Conn. Allen Latham.

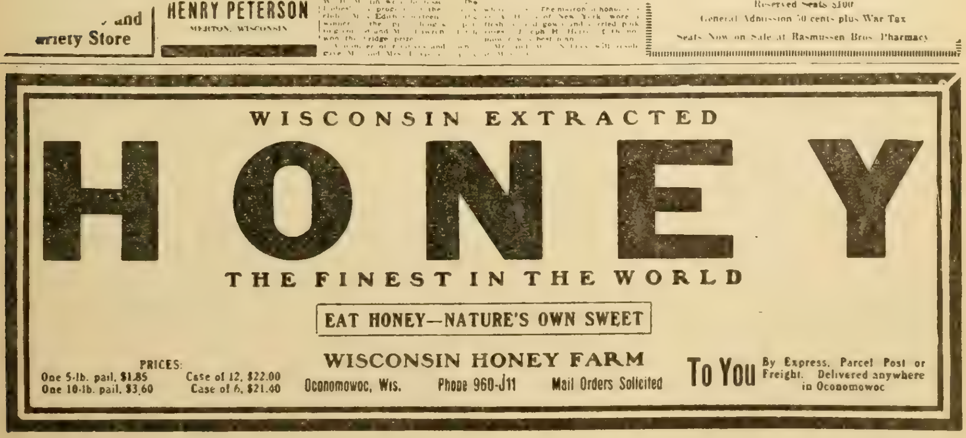
LOCAL HONEY ADVERTISING

How a Beekeeper Sold 10,000 Pounds of Honey at Retail

It pays to advertise, is the old slogan, and my advertisement gave a very good profit on the investment. Every person that put his eyes on the paper must have seen the ad, as it was the most prominent ad in the paper, at least in respect to the size of the word "Honey." This ad cost me about $9.00 an issue, and was shown twice, followed by smaller ads. My total bill for this class of advertising was $50.00, and it moved for us about 10,000 pounds of honey at retail. Surely this was a good investment. C. W. Aeppler.

Oconomowoc, Wis.

[With the present condition of the wholesale market for extracted honey, local advertising of this kind is probably the very best solution of the marketing problem. Many beekeepers have already disposed of large crops of honey at fair prices by advertising in local papers or in farm journals, and every pound sold locally relieves the wholesale market just that much.—Editor.]



and
riety Store

HENRY PETERSON

General Admission 50 cents plus War Tax

Seats Now on Sale at Rasmussen Bros. Pharmacy

WISCONSIN EXTRACTED

HONEY

THE FINEST IN THE WORLD

EAT HONEY—NATURE'S OWN SWEET

PRICES:
One 5-lb. pail, $1.85
One 10-lb. pail, $3.60
Case of 12, $22.00
Case of 6, $21.40

WISCONSIN HONEY FARM
Oconomowoc, Wis. Phone 960-J11 Mail Orders Solicited

To You By Express, Parcel Post or Freight. Delivered anywhere in Oconomowoc

Mr. Aeppler's advertisement extending across the foot of a page in the Oconomowoc Enterprise, Aug. 6, 1920.

SIFTINGS

J. E. Crane

On page 74 of February Gleanings, speaking of the proper cellar temperature for bees an editorial says, "It should be high enough so the bees will not need to generate much heat to keep the cluster warm, yet low enough to cause the bees to form a cluster and remain quiet within the hive." No better rule than this can be given for a cellar or hive temperature during the bees' winter confinement.

* * *

I agree most heartily with A. I. Root, in "Our Homes" for February, in standing up for the Christian Sabbath and in denouncing the Sunday newspaper. I fear few people realize the benefits and blessings the world receives from Christianity, imperfect as it is. If we but stop to look around and see how large a part of the sorrow and suffering of the world comes from the lack of Christianity, and again note how large a part of them would disappear if the Golden Rule were universally followed, we should surely have peace on earth, and blessings of which we can now hardly conceive.

* * *

Grace Allen, on pages 94-95, tells us in a fascinating way some of the charms and inspiration that come to even a "sideline" beekeeper, and she is right. How true it is that as one becomes enthusiastic over bees he soon becomes interested in every tree and shrub and flower, every bird, animal, and insect; and slowly and stumblingly he learns to read the thoughts of the Great Creator, and before he knows it he is living in a new world!

* * *

Our friend Byer, on page 98, makes a good point when he asks, "Do we find the cattlemen asking for a tax to be placed on every bovine specimen in Ontario to raise a fund for inspection, so as to have tuberculosis, foot and mouth disease, blackleg, etc., banished from their herds? He argues that no more should beekeepers tax themselves for the inspection of their bees. He is quite right. It is as much the duty of the government to protect the beekeeper as the dairyman or breeder of swine.

* * *

Morley Pettit, on page 76, speaks of a "food-chamber." Now this is a comparatively new word and a good one, too. Food-chamber rhymes with brood-chamber and one is complementary to the other, neither perfect without the other. It is not expected that the food-chamber will always contain only food or that the brood-chamber will never have honey stored in its combs, but that the main use of one is for the rearing of brood and the other for the storage of food. Where we are producing section honey in short seasons, and at the close of the harvest we remove the supers of sections and find but little honey in the brood-chambers, we can go to our colonies that have been given food-chambers instead of sections to fill and remove a food-chamber and give to each colony run for comb honey enough honey to keep up brood-rearing until the close of the season. It will then be found, under normal or average conditions, that such colonies will generally have a good supply of bees and honey for winter. Where seasons are short, I believe it will prove good practice to use a part of the yard for filling food-chambers for the use of colonies run for section honey.

* * *

In a letter from Luther Burbank given by A. I. Root, page 109, Mr. Burbank says, speaking of the annual sweet clover, "These plants offer a great opportunity as a plant improver, as they vary very greatly." Now who shall take these plants and produce something still more useful than the plant we now have?

* * *

No one need lack for the best methods of wiring frames after reading those given on page 82 and following pages; but, after all, much will depend on the thoroughness with which the work is done. The best system may fail, if the work is done in an easy, slipshod way.

* * *

Carl E. Johnson, page 101, is on the right track in placing a tin tube three or four inches above the entrance to connect the brood-chamber with the outside thru the packing to prevent clogging. We have such tubes on hundreds of our hives wintered outdoors, only we use a ⅞-inch tube.

* * *

Louis Biedigar of Texas, in the Beekeepers' Item, wonders why all northern beekeepers want their hives to face south or southeast, while he has the best results with hives facing north during winter. It is just "locality," my friend; yes, "locality."

* * *

That is interesting reading about "Nails and Nailing," on page 88. How many of us know the proper length and size of nails, or the distance apart to place them in different kinds of wood?

OUR FOOD PAGE

CONSTANCE ROOT BOYDEN

Stancy Puerden

A CERTAIN man whose work is with the publicity end of selling honey said to me recently, "Mrs. Boyden, I wish you would touch on the necessity of emphasizing the purity of honey." And that calls to mind an incident of which I am going to tell you.

A few weeks ago at a dinner, while we were enjoying our coffee a professional man who sat next to me said: "You know a large percentage of what we buy as coffee is not coffee at all. It is a clever substitute pressed into the shape of the coffee berry." I politely tried not to look as incredulous as I felt. I suppose some of the coffee which is sold ground may be adulterated, altho Uncle Sam's pure food laws are such as to make it unpleasant for the offender if he is caught; but I cannot think it would pay to make expensive machinery to press the stuff into the form of the coffee berry, even if such a business could remain undetected.

Perhaps it was the more difficult for me to believe such a story, told by the narrator in good faith, of course, because of that old story of artificial comb honey, which seems to be such a hardy perennial. Years ago, when I was a very small girl, A. I. Root offered $1,000.00 reward for a sample of artificial comb honey and had cards printed to that effect; but, altho the cards were widely distributed and the offer is still open, no one ever claimed the reward. Perhaps the story originated from the fact that beekeepers' supply houses buy quantities of wax and make it into foundation, and the uninitiated do not know how little resemblance there is between the strip of foundation and the finished comb.

Man has more or less successfully imitated flowers and fruit in surface appearance only. I don't believe anyone has ever even attempted to make an artificial fruit like the original in texture, juice, and flavor, one that could be eaten. But did it ever occur to you that comb honey with its fragile, translucent, pale golden beauty simply cannot be successfully imitated, even as to outward appearance. You have doubtless seen artificial fruit which might deceive one at a distance, but you never saw a rubber or composition model of a section of comb honey, did you? And artists and photographers will tell you it is one of the most difficult subjects to paint or photograph satisfactorily.

And yet that absurd story of artificial comb honey has been told within the past year not 50 miles from Medina, which is sometimes referred to as "the sweetest town on earth," on account of the amount of honey handled here.

AS to extracted honey, that is a different story altogether. It undoubtedly could be adulterated in a way that would deceive the average family buyer. Notice I say "could be," not "is." In a State which has inadequate pure food laws the unscrupulous dealer could sell an adulterated honey in a small way, and perhaps does for a short time. But if his business grew to such an extent that his honey was shipped into another State, then the long arm of Uncle Sam would reach him and make him realize that he was engaged in a very unprofitable occupation, to put it mildly. For the Federal laws are very strict when it comes to shipping impure or adulterated foods from one State to another. And in most States there are pure food laws which protect the consumer just as adequately.

Someone may say, "The honey dealer or packer may have the best of intentions and yet in buying honey he may unwittingly get hold of a lot of adulterated honey from an unscrupulous shipper." That is only too true, and that is why the largest honey bottlers in the country maintain a well-equipped chemical laboratory where a sample of every shipment is analyzed.

Now you want to know, don't you, whether many samples of adulterated honey have been detected by the chemists whose duty it is to guard the honey-packing business. Some adulterated honey has been detected, it is true, but I believe I am safe in saying it is only enough to be the exception which proves the rule that the bulk of honey on the market is pure.

IN a recent issue I mentioned a sanitarium where the only sweet allowed to the patients is honey. The head of that institution, Bernarr McFadden, who also founded the magazine Physical Culture, writes on "Breaking a Fast," in the January issue of Physical Culture. Whether we approve or not of the modern fad of curing various ills by fasting, we beekeepers can heartily endorse the method of breaking the fast and rejoice that a prominent health writer, not particularly interested in bee culture, appreciates the food value of honey. The following is a quotation from his article:

"But the principal thought to bear in mind in breaking a fast is the use of very minute quantities of food and large quantities of water, warm or cold, whichever may be the most pleasing. It is frequently desirable to flavor the water with a little fruit juice or with honey. In fact, water sweetened to taste with honey is perhaps the safest method of breaking a long fast. Honey taken in this manner is absorbed almost immediately into the system, and will assist in giving the digestive organs the strength needed to digest other foods. An orangeade sweetened with honey is also effective and valuable in these circumstances.''

SOME of the readers may think OUR FOOD PAGE is beginning to bear a strong resemblance to a yeast advertisement in the way it brings up the subject of vitamines so frequently; but, altho I plead guilty to beginning the subject, it is the many letters from you subscribers which lead me back so often.

Let me begin by making this disappointing announcement: The article telling of his research work on vitamines in honey by Philip B. Hawk of Jefferson Medical College, Philadelphia, is not yet out, nor has he notified us in what publication it will appear, altho we received a notice that it was in type weeks ago. The proverbial mills of the gods have nothing on some scientific men for slowness.

To make the subject clear to those readers who have not seen the articles on vitamines and to refresh the memories of the rest, let me review a bit. Vitamines are sometimes defined as unidentified dietary essentials without which there cannot be proper growth, reproduction, or maintenance of health in human beings and animals. Some variety is present in practically all foods in the natural state, but they are largely removed or destroyed in many modern foods by so-called refining processes.

Three classes of vitamines are now recognized: Fat Soluble A, Water Soluble B, and Water Soluble C. Water Soluble B was the first vitamine discovered, and it is found in wheat germ, rice polishings, yeast, etc. This prevents such diseases as beriberi and polyneuritis, and encourages growth. Fat Soluble A is found in abundance in the fat of milk, egg yolk, the green, leafy vegetables, young carrots, cod liver oil, etc., and we now know thru Prof. Hawk's experiments that comb honey contains distinct amounts of it. The absence of this vitamine in the diet causes lack of growth and reproduction, rickets, and an eye disease which results in blindness. Water Soluble C is in living vegetable and animal tissues and is found in abundance in fresh fruits and fresh vegetables, and its use prevents scurvy. We have known for some time that citrus fruits, particularly oranges, are rich in this vitamine, but it has more recently been pointed out that tomato juice compares favorably with that of oranges.

On the ordinary mixed diet none of us may be in danger of the blindness brought on by lack of the Fat Soluble vitamine nor such diseases as beriberi or scurvy, but it is probable that much ill health less well defined is due to a deficiency of one or more of these vitamines in the diet.

The report of Prof. Hawk's finding distinct amounts of the Fat Soluble vitamine in comb but not in extracted honey immediately led to a discussion which brought out the fact that two samples of extracted honey were used in the feeding experiments, one of clover honey, unheated, and one of a blend, heated only to the point which prevents granulation under ordinary circumstances. Professor Hawk believed that the wax contains the Fat Soluble vitamine, while some of us doubted whether nature would put so valuable a food constituent in the container of the food for the bees and thought it might be in the pollen dust which is found in minute quantities in honey. At this point I am going to quote from ''Making Friends With Vitamines,'' an interesting popular article in the February Ladies' Home Journal:

''Neither the ordinary cooking nor pasteurization has much effect in diminishing or deteriorating the Fat Soluble vitamine. It seems that butter loses some of this virtue by long storage.''

Now I wish some one could make some feeding tests with honey immediately after it has been taken from the extractor. If the Fat Soluble vitamine is unstable enough to disappear from butter after long storage, it might be lost from honey in the same way. The article from which I quoted did not state what was meant by long storage, whether it was some three months or several years.

ALTHO scientific men seem to think it may be accidental here is an interesting fact: the color yellow seems to be associated with the Fat Soluble vitamine in foods. Notice that butter fat, yolk of egg, yellow corn, young carrots, and sweet potatoes contain the vitamine while white corn is said to lack it. Yellow is one of the colors which go to make up green and we know that the green, leafy vegetables are rich in this vitamine. I believe it was R. Adams Dutcher, of the Minnesota Agricultural Experiment Station, who has in the past done some research work on honey, who pointed out that the milk of grass-fed cows is richer in the Fat Soluble vitamine than the milk of a cow on winter rations; and we country dwellers all know that butter fat in the early summer is a rich yellow, and that the egg yolk is a richer color when the hens have access to green foods. The fact that honey, wax, and pollen have more or less of the yellow tint may or may not be significant.

A certain dairy lunch in Cleveland features honey prominently in connection with its dairy products. As comb honey contains the same vitamine which is found in the fat of milk the association of them seems particularly appropriate, altho I don't suppose the proprietor had any such scientific reasons for handling honey. Perhaps the frequent scriptural association of milk and honey subconsciously influenced him.

(Continued on Page 187.)

Beekeeping as a Side Line

Grace Allen

THE great Linnaeus once wrote of the opening of a flower, ''I saw God in His glory passing near me, and bowed my head in worship.'' Any man who has let his heart keep pace with his head in his study of flowers will repeat the words of the old Swedish botanist, while he, too, bows his head in worship before the marvel and the beauty of a flower.

If he be a beekeeper, tho he will love all flowers, he will gradually develop an especial interest in those that bear nectar for his bees. And what a list that is! There are almost countless flowers that help in the economy of the hive, many of them yielding such small amounts as to be scarcely noticed by the beekeeper, yet in the aggregate contributing substantially to the bees' income. Learned and careful observers have varied greatly in the attempt to estimate the amount of honey consumed in a year by an average family of bees. One of the lowest estimates, however, if not the lowest, is 200 pounds. It takes an immense quantity of nectar to make 200 pounds of honey; it calls for millions of trips to the fields and countless flowers to be visited. And in addition to what is gathered for its own needs, the average colony in the hands of a skillful operator will yield a surplus of from fifty to several hundred pounds of honey.

There is a popular misconception, however, outside the ranks of beekeepers themselves, as to the value of such flowers as those we cherish in our own gardens, roses, daffodils, dahlias, nasturtiums, and all the lovely array. Often a person who has just thought of the possibility and pleasure of keeping bees will exclaim enthusiastically, ''And I have the loveliest yard for them! All sorts of flowers!'' It may be a lovely yard to keep them in, in that it makes a charming setting for the hives, but the amount of nectar in even a large garden is not enough to be considered. It requires great stretches of nectar-bearing flora to yield enough to make even a few colonies surplus-producers. Yet there are very few places where one or two colonies will not flourish. For in nearly every locality there is at least one important and fairly dependable source of nectar, in many localities there are several, and in some favored spots there is almost a continual flow.

Probably the honey plant that is most important over the widest area is white clover, the little creeping Dutch white clover. This springs up of itself, making a soft green cover over pasture and lawns, roadsides and commons, until May comes swinging her baskets of beauty across the land: then the white clover puts out its millions of blossoms and makes a soft white cover for the earth. All thru the east and north of our great country and our great neighbor Canada this nectar yielding plant spreads, producing hundreds of tons of the most excellent honey. It crosses the Mississippi, running west for a state or two, and crosses the Ohio, running south for a state or two. But along these edges of its habitat, it blooms with less wealth of profusion and less wealth of nectar, too.

Thruout the irrigated sections of the mighty West, alfalfa, a first cousin of white clover, becomes the main source. One strange thing about alfalfa is that east of the Mississippi it is of little or no value for nectar. But what fine-flavored alfalfa honey from the West crosses the Father of Waters by the carload!

Sweet clover is what we may call a coming honey-plant. It is already here, extensively, yet it is still coming. For it is growing constantly more popular with both farmers and beekeepers. It flourishes in the white-clover region, the alfalfa region, in the South — in fact, almost anywhere. It has lived down a bad reputation it never deserved. A noxious weed it was once called, but now agricultural stations vie with one another in adding to our information regarding its possibilities. It has one characteristic that endears it to beekeepers. Tho taking most kindly to a limestone soil, it easily takes root and grows tall and rank when sown along roadsides and railroad cuts. The honey of sweet clover is so spicy and pungent that many an uninformed purchaser has accused it of being artificially flavored with cinnamon or vanilla.

In California the sages are the chief dependence, the sages and the citrus trees. There are white sage and black, purple sage and still others. And sage honey and orange honey are deliciously worthy of California. In Texas and the great Southwest are mesquite, catclaw, huajilla, and other honey plants unknown in other parts of the country. In Florida and her immediate sister States are citrus trees, gallberry (holly), tupelo, sour gum, and that mighty yielder, black mangrove, killed or tragically injured a quarter century ago by an unforgettable freeze from which it has scarcely yet recovered. And in its own proper but varied sections is cotton, with nectar not only in its blossoms, but also in ''extra-floral nectaries'' under the flowers and leaves.

One of the first things the new sideline beekeeper will need to learn will be what nectar-bearing plants are in his own locality, and when they bloom. His ''locality'' as a beekeeper will be the area visited by his bees, roughly represented by a circle having his hives for its center, and sweeping around on all sides on a radius of—say from a mile and a half to three miles, usually. Indefinite? Yes, but the statement is no more so than the fact itself. It depends on so many things—what there is to gather near and far, hills, forests, water, winds, and other things. Bees are supposed usually to make a flight of about a mile and a half average. Claims of seven and eight miles have been made, more or less well supported—but conditions being always unusual. It is really quite simple. They can and will fly very far if there is nothing near to gather and no great obstacle in the way; when there is pasture nearer, they are wise enough to forage there instead of flying further. Wordsworth knew that:

> ". . . . . . Bees that soar for bloom
> High as the highest Peak of Furnese Fells
> Will murmur by the hour in foxglove bells"

that are nearer home, and be content. So the question, "How far will my bees fly?" can not be answered in one word.

The succession of main nectar-bearing bloom in the average white clover area is about like this. Early in the spring, indeed even while it is still wintry, the earliest maples and willows and elms will come into bloom, and in those fringy tree-tops the bees will find abundant pollen and some nectar. These early sources, and usually all that precede the white clover, will be of value only for what the beekeeper will learn to call "building up the colony," that is, for feeding the thousands of young bees that must be reared before the main flow comes on, so that they may be ready to rush out to gather it in all its profusion. Then in March or April, according to latitude and season, orchards and scattered fruit trees will burst into bloom. From all these, apple chiefly but likewise peach, plum, pear, cherry, the bees will gather varying amounts of both nectar and pollen. The beekeeper will fairly hold his breath—aye, and the apple orchardist may well hold his—in his eagerness for good weather during this period, that his bees may have full advantage of this bloom. Then there may be a dearth, until May or June spreads out the clover bloom. When it comes, it will last perhaps three weeks, perhaps eight, probably averaging six weeks. This is the golden period of the beekeeper's season, the time when the bees rush in and out, and cram the new thin nectar into thousands of waxen cells to ripen into honey. The wise beekeeper never lets them become cramped for storage space, for from this flow he will take the surplus honey for himself. After this, summer often drags in another dearth, in late July and August—tho of course what happens in one month in one latitude happens in another month in another latitude. Then come the flowers of autumn, chiefly wild asters and goldenrods, gay and generous composites. Of these two the goldenrod is the gayer while the aster is the more generous, and therefore more important to the beekeeper. And again the bees make merry, gathering what they will need for food during the long silent winter.

This, then, very briefly, is the general succession of the flora of the white-clover region—early trees and fruit bloom to build up on, white clover for the main flow, the flow for surplus, and fall flowers for winter stores.

Yet to this must be added many things. Some localities are favored with certain additional sources of nectar in sufficient quantity to count, and other locations with still others. In the spring, dandelions may make the earth a veritable "Field of the Cloth of Gold," where the bees will gather both pollen and nectar, more pollen than nectar. How they reel in with their loads, dauntless buccaneers that they are! In some places, between fruit bloom and white clover, the black locust tree hangs out her graceful clusters of fragrant white blossoms, heavy with nectar. In other sections thru the spring or early summer come other tree nectars, basswood, one of the heaviest yielders when it yields, sourwood in the mountains, and tulip poplar, with its great blossom-bowls filled with insect guests. In some places farmers may have extensive acreage of alsike and crimson clover, that spread their brilliant bloom for the bees in spring or early summer; while bees elsewhere will gather midsummer riches from the heavy yielding buckwheat. Over wide areas sweet clover blossoms in July and lasts till fall. In some places late summer sees heartsease and Spanish needle giving of their sweets, or a little later, boneset spreading her feast. There are some sections where a second surplus may confidently be expected, from sweet clover perhaps, or buckwheat or boneset.

Among the countless minor sources of either nectar or pollen, which in certain favored places or seasons may become important, are wild raspberry and fireweed (willow-herb), especially in the burned-over forest lands of the North, sumac, wild sunflowers, milkweed, pennyroyal, manzanita, persimmon, barberry, horsemint, thyme, and many others, including in lesser degree even our humble garden friends, asparagus, carrot, mustard, and turnip. Corn gives pollen, and some people claim nectar too, from the tassels (at least one beekeepers' convention has had a sample of "co'n tossel" honey proudly displayed). Wayside weeds like cocklebur and ragweed give pollen and the Canada thistle, nectar. Even the parasitic mistletoe brings its gifts, blooming in Texas in January and February, and thus giving the bees of the Lone Star State their first nectar and pollen of the season. And, oh, the many, many others!

FROM NORTH, EAST, WEST AND SOUTH

In Southern California.—There is little or no sale of honey except in small lots in a retail way. Almost all crops are in the same boat when we consider prices. All expected just this reconstruction period, and yet few were prepared for it. Supply dealers are offering much lower prices to the beemen than two or three months ago. There is no cause for any great anxiety in the matter. Prepare for a crop and produce it just as economically as you can, consistently with the general conditions. The writer has sold honey in times past at a figure really below the cost of production, if an honest labor and expense charge were made. But with present methods of marketing, it is not likely that we shall be called upon to do so again.

Southern California has had a fine lot of rain during January. Plant life is about normal for this time of year (Feb. 4). Rainfall first and then the right weather conditions make our native ranges yield the nectar.

At a recent meeting of the Riverside County Beekeepers' Club, one of the matters discussed was that of a state-wide law regulating the moving of bees thruout the State. The county-ordinance plan is becoming a nuisance to many migratory beekeepers. A committee was appointed to take up the matter and see if something cannot be done or a law enacted governing the matter. Reasonable protection from disease is all right, but a law such as, "No bees to be moved from a district or location within 25 miles of an apiary containing foul brood, etc.," is preposterous.

A letter was read from an Inyo County beekeeper describing the "contraption" found when a thief was surprised at 3 a. m. in a beeyard. This fellow had been shaking bees from the hives into this wire box and had been carrying them away, leaving the hives to all outward appearances the same as before. But upon opening the hives the owner found them almost depopulated. Several apiaries have been almost ruined in this way. The man who came on this thief had been so worried about his apiary that he could not sleep and walked out into his yard at this early morning hour. He so completely surprised someone that the thief in his haste to get away left his outfit. He left also a gunny sack that had been wrapped around his feet and some red hair as he hurried thru the barbed-wire fence.

Our committee on prevention of bee-stealing reported progress and recommended one or two methods whereby beekeepers might identify their property at any time.

Several rewards were paid by the club the past season for the conviction of persons found guilty of setting fire to bee ranges. The members present were not satisfied with the results, and a resolution was passed protesting against the leniency of the punishment imposed.

We are painting the hives containing bees in our out-apiaries. Those in one story are painted first, as we can paint the supers that we take off to better advantage after being removed from the hives. These colonies were all examined during the fall and left with enough stores to last until February or March under normal conditions. But this being an open, dry winter, it is likely that a number will need some attention soon. We shall look into any doubtful ones and give frames of honey from those that can spare them. This condition we ascertain by lifting the hive or else raising the cover and glancing at the top-bars for sealed honey.

Members of the committee on advertising for the American Honey Producers' League report progress and a willingness of both supply dealers and honey producers to donate liberally to a fund to advertise honey nationally. This seems to be a good way to start, and, as the organization is perfected, all honey sold thru the efforts of the organization should bear the greater share of the expense. If the beekeepers could be brought to realize the importance of advertising, all would be willing to give a small per cent of their income for this purpose, and the rest would be easy.

Corona, Calif. L. L. Andrews.

* * *

In Northern California.—Last spring a number of beekeepers from Merced County and points north of Sacramento reported alarming losses of bees. The losses occurred in isolated apiaries. In some cases there would be but a handful or two of bees in a hive, which otherwise had from six to ten frames of brood. The bees remaining in the hives were perfectly healthy, and there were no indications at the hive entrances to suspect poisoning or some new adult bee disease. Frequently queens were missing as well as bees, and in one yard in particular there were not enough bees left in some of the colonies even to start queen-cells. Furthermore, some colonies with full brood-nests had supers partly filled with fresh uncapped honey. The losses were due unquestionably to bee-highwaymen or bee-gangsters, and they occurred at a time when pound packages were very much in demand. In Stanislaus County several beekeepers discussed the situation, and it was thought best not to make the matter public but to try to catch the thieves. There were no more losses reported, which was, no doubt, due to the fact that the demand for package business was considerably on the decline. It appears that the robbers would drive up to a yard towards dusk and proceed to shake bees into empty cages. Such a procedure takes but little time and leaves mighty little evidence upon which to form a clue. We hope that our package men, who buy bees from various beekeepers in order to supply their demand, will endeavor to make their purchases only from reliable beekeepers.

For two winters now we have not reported such bright prospects, owing to lack of rain in our section. This winter we had three or four times the amount of rainfall that we had last winter, and our rainfall to date is well above normal. Not since 1916 have we had a good crop. Of course, in the irrigated districts alfalfa has yielded but not to the extent that it should, for the reservoirs held an insufficient amount of water, due to the lack of snowfall in the mountains. Alfalfa, however, represents but a portion of our crop, and ordinarily August, September, and October give us fine yields from the various fall-blooming plants, including the willows, which are responsible for the aphid honey. The rainfall during the past few years has not soaked the soil sufficiently to insure the best conditions for our fall honey plants. From present indications it would appear that our valleys are getting their much-needed drenching and that we may again enjoy a fall honey harvest.

If it isn't one thing it is another. For several years now the crops have been light but prices good. We are now confronted by good crop prospects but also by a falling and a weak honey market. The situation is far more serious than is generally supposed, as you will be told by all beekeepers that have kept a proper set of books and know their cost of production covering the calendar year for 1920. If our cost of production for the coming year should be as high as it was for 1920 and the price of honey remains at what it is quoted today, then the business of beekeeping is going to be operated at a loss. It is the opinion of the writer that even under such conditions a normal crop of honey would not be a sufficient production to insure a profit to the business. It surely would not be if the production consisted of low-grade honeys. The remedy, on the one hand, is to cut the cost of production. Labor, which is the principal item, no doubt will receive a reduction this year, and containers are another item which has always been too high. In the future, we hope that an exchange will make it possible for practically all of its members either to pack directly in 5 and 10 pound pails or to furnish them with steel drums, which can be used over and over again, as a means of transporting honey to the bottling plants. On the other hand, the remedy lies in receiving a better price for our product. In order to accomplish this the Exchange proposes to advertise its brands.

The remedies heretofore mentioned are directed chiefly to the bottled products. Our low-grade honeys are in dire need of a higher protective tariff, if their production is to be made worth while. Central and South American beekeeping appears to be on the increase, and the United States is not by any means a heavy exporter of honey. It would appear that a tariff of 20c per gallon should be restored on honey imported into the country. Let us trust that the Exchange will become a member of the Agricultural Legislative committee and present before this body its desires along the lines of a protective tariff. The Exchange could gather the export and import statistics and such price data as are necessary, but it would have to receive from its members their figures on cost of production. It is exceedingly strange that a matter so vitally important to our business as the cost of production, has received so little attention in the past not only by the beekeepers themselves but also by the beekeeping press. M. C. Richter.

Big Sur, Calif.

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In Texas.—The weather throut January has been very mild, even for Texas. Two short periods of cold occurred, there being frost on two mornings. A large portion of the month was warm and bright so that many plants bloomed. Peaches, pears, huisache, rock brush, agarita, and numerous annual plants are in bloom all over southwest Texas. Mistletoe, elm, elbow brush, willow and swamp maple are in bloom in central and north Texas. Bees have been active thruout the commercial section and have consumed large amounts of honey. Perhaps 10 per cent of the colonies need feeding.

The beekeepers of Texas were much interested in the various references in the bee journals of the past months relative to the soil and honey plants. We believe that nowhere else is soil relationship so plainly shown as in Texas. Unique among these plants are huajillo, como, cotton, and the two kinds of horsemint. These divisions are so marked that within a half mile the flora changes entirely.

The Texas Honey Producers' Association held its annual meeting at San Antonio, Jan. 18 and 19. A large number of members were present. The report of the business showed a very prosperous year. During the year the capital stock was increased from $15,000 to $65,000 and all stock sold. $64,180.25 represents the amount of bee fixtures sold, and $181,529.70 the value of honey placed. Because of the increased capital stock two additional directors were elected. The board for 1921 consists of the following: E. C. Collier, Hillsboro (formerly Goliad), president; W. O. Victor, Uvalde, vice-president; Alma M. Hasslbauer, San Antonio, secretary; Louis H. Scholl, New Braunfels; Louis

Biediger, LaCoste; Wm. Zimmermann, San Antonio; Ambrose Johnson, Laredo; R. A. McKee, Velasco, and E. G. LeStourgeon, San Antonio, manager.

The annual Mexican supper was attended by about 100 members and friends, and only those who have been at one of these banquets can picture the amount of bee-fur that was pulled. The new packing plant was inspected by the members. The heating and blending tanks, the net weight fillers and can-plugging machines were of great interest to the visitors.

The members voted that the Association become a member of the American Honey Producers' League and pay the advertising assessment levied by that body. The resolution committee in its report included a memorial to Dr. Miller, a section pledging the members to support the movement for the establishment of a memorial scholarship, and one thanking the gentlemen who are in charge of this work for an opportunity to help.

The members were much in favor of advertising honey nationally and Texas honey locally. In addition to their assessment to the League, the Association voted to pay one cent per colony for further advertising.

As has been reported before, the beekeepers of Texas, in spite of the very large crop of 1920 and the slump in market, have disposed of their crop, most of it having been sold before the break came. One reason for this is the fact that most of the crop was on the market by July 1.

H. B. Parks.

College Station, Tex.

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In Ontario.—Weather conditions up to date (Feb. 9) have continued milder than usual, and we have had but three days when the mercury has touched zero mark. While bees appear to be wintering well outdoors, some beekeepers have reported that they have had difficulty in keeping temperatures low enough in cellars and other repositories. Out near Kingston our bees are wintering in a repository built entirely above ground; and, while this particular building generally gives good results, yet it means constant attention to keep it cool enough in a winter like this. With over 250 colonies in the building, naturally a lot of heat is generated from so many bees.

While the moderate weather is good for the bees, clover is suffering more than usual from the effects of alternate freezing and thawing. There is no snow here at all, and this condition applies to most of old Ontario south of the Parry Sound district and west of the eastern fringe of counties. There may be some exceptions to this statement; but, in the main, judging by reports I have received, it is correct. Naturally prospects look none too good for clover, but it is too early to make any authentic statement as to what we are likely to have by May 1.

Honey markets show no improvement since last writing, and the wholesalers have very little in stock, the bulk of supplies on hand, contrary to usual conditions, being mostly in the hands of producers, so far as I can learn. It looks as tho concessions will have to be made to move the crop before another season. On the other hand, with prospects poor for clover in 1921, some may prefer to take a chance and hold their honey over.

The different schemes, given on page 82 of February Gleanings, relative to different methods of wiring frames, should be well worth the price of a year's subscription to any beginners and many an old-time beekeeper as well, since sagged foundation with resultant drone-cells is all too common in most apiaries. A number of Ontario beekeepers use a method not described in the article at all, namely, simple vertical wiring without any crossing of wires in any place. The late Mr. McEvoy was enthusiastic as to this method, and all his frames were wired that way. We have wired hundreds that way and much prefer the vertical method to any other. Of course, the objections are that a heavier bottom-bar is needed, and it is difficult to pierce holes thru the thick top-bars. Mr. McEvoy used small staples driven in under the side of the top-bar to put wires thru, but we have always pierced the top-bars, believing that it is more rapid and makes a better job. Aside from bottom-bars being sprung up a bit sometimes, I still think the vertical plan is at least as good as many other plans given — indeed, much better than some of them.

I have recently been in correspondence with some southern breeders regarding the matter of getting some package bees sent in by mail, as some friends of mine wished me to get them a few. I find that the two-pound package when ready for mailing weighs about six pounds. While that weight is all right for the United States mails, it seems that four pounds is the limit for Canadian mails, hence the two-pound packages are not admissible to our post-office. I wonder if this is generally known. It seems too bad that there is no uniformity in the mailing system between the two countries, since daily interchange of mails on a large scale is in progress all the time.

Owing to exchange rates, express companies ask shippers to prepay express charges in United States money, and this factor, together with alleged poor service and high rates, has caused many shippers to send bees by express. J. L. Byer.

Markham, Ontario.

HEADS OF GRAIN FROM DIFFERENT FIELDS

Mexican Palo-verde. A species of palo-verde (**Parkinsonia aculeata**), of which there are many trees on the university campus, blooms profusely in May and is much worked by bees. It seems certain that a considerable proportion of the first crop from the campus colonies was from this so-called "Mexican palo-verde," or "bogota;" but the honey was of good quality, in no way inferior to the rest of the mixed light amber honey of that period of the year, and superior to some of the local honey of other apiaries produced at the same time. This tree then appears to be a honey plant of no small importance where abundant, but it is a native of Mexico and extends into Arizona only a little way in the extreme Southwest, its natural range ending about 45-50 miles southwest of Tucson. It is doubtful whether any other apiary in America is so located as to be within reach of any number of these trees, and an effort to secure further data on the amount and character of its honey will be made.

Tucson, Ariz. Chas. Vorhies.

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The Thirteen-Frame Hive. Wanting to try out this unlucky 13-frame 20-inch square hive instead of waiting to learn from someone else's experience, I made 30 of these monsters 18 months ago. Last year being a poor year here in southern California, I could not give them a good trial, altho even then they gained over the 10-frame colonies in the orange flow. This year, however, I tested them out fairly and squarely. The square shape is one improvement over the 10-frame hive. Set the hive level on the stand for the summer and set each super on so the frames run crossways of each other. This does away with burr comb's being built solid between the supers. The second advantage is that one can space the frames to suit himself. With a 10-frame hive you must have eight thick combs in a super for extracting or nine thinner ones; and with nine in the super they are really too thin to uncap well, while with eight they are sometimes too far apart and the bees build too much comb up between them. But, with a 13-frame hive, 11 frames in the super work out well. The third advantage is less swarming, and the queen stays down below better. A 13-frame hive four supers high is better than a ten-frame hive with supers six high. And a hive three supers high or with two supers on the broodnest is easier than a 10-frame four or five high. Fourth, there is also less lumber in a three-story 13-frame hive than in a four-story ten-frame hive, less paint, and the hive doesn't heat up so much.

Riverside, Cal. Chas. S. Kinzie.

Selling the Honey Crop. The year of 1913 was our best season for honey production. Our crop was a trifle over 15,000 pounds, all extracted. About one-half was sold to commission men at a low price. Then I thought out something. I decided to advertise in a live-stock journal, which was a hit. The honey was put up in 60-lb. cans, two cans to a case, but most of it unsold in smaller lots. We gave away no samples, but charged 6c each for them. We also sent out an order blank. Since that time we have been selling to the consumer direct, not by advertising but on the city market, until the summer of 1920 found us so busy with our farm work (we have 86 acres) we were obliged to advertise in our county newspapers and sell at the apiary. The ad read: "For Sale—Delicious honey. Clover and fall flower blend, in 10-lb. pails, here at the yard 1½ miles N. E. of Lakeville, Ind., $2.25 each. C. A. Bunch."

A small amount, perhaps 10 per cent, was shipped away in 10-lb. pails and 60-lb. square cans. Our honey was nearly all sold by Dec. 20. The cash received for the crop from 70 colonies increased to 86 was $1690. About two tons, or half of our honey, was white honey which we sold the same as the blend, $2.25 per pail of 10 lbs. It is reasonable to believe that many cars of honey could be sold direct to farmers and live-stock men at a good price, if the beekeepers would advertise in the farm papers.

Lakeville, Ind. C. A. Bunch.

* * *

Why Invalids Prefer Comb Honey. In a recent Gleanings, in discussing why invalids should prefer comb honey, John Preston True says:

"Isn't it quite likely that nature knew what she was about, and supplied the indigestible wax with the honey to compel chewing, thus giving the needed saliva for its right digestion. That's my guess."

There is no doubt that chewing wax does stimulate the action of the salivary glands and produce an abundant flow of saliva, which may assist to some slight extent; but I am sure this cannot be the reason for the difference in the physiological action.

I believe a better explanation of the phenomenon would be that those particles of indigestible wax, coming in contact with the intestinal walls, stimulate peristaltic action, that peculiar worm-like movement of the intestines by which their contents are forced out. In other words the indigestible wax in the alimentary canal assists in elimination. The extracted honey, with the addition of horn shavings, or any other indigestible substance, would get the same results as the wax in the comb honey.

Illmo, Mo. R. G. Williams.

HEADS OF GRAIN FROM DIFFERENT FIELDS

Moth Larvae in Winter. It might be of interest to those who have frames of honey or comb stored where it is warm enough for moths to exist, to examine them occasionally.

Several supers of frames of comb containing quite a little clover honey were sulphured and stored away for spring feeding, if found necessary. They were placed near the furnace in the cellar. Smelling the fresh honey quite fragrantly today, I was under the impression that perhaps mice had in some way gained admittance to the supers, but found instead quite a few moth millers and worms. Several frames had been cut up quite a little. Upon placing these frames out in the cold the worms and live millers became cold and stiff and apparently dead. These frames will have to be sulphured again before being put in back in the cellar. I believe any who have frames stored under similar conditions, even if these had been previously treated to destroy moths, should examine them occasionally. These frames had been stored away from the cold to prevent the honey from candying. I do not remember having ever read of such an occurrence in any of our magazines, nor have I heard any verbal comment. Where did these moths come from, and how did they get in? The frames had been stored in the cellar all this time, and the moths had apparently been there only a week or so. A. H. Clagg.

Bellefontaine, O., Jan. 17, 1921.

Bees in His Phonograph

''Truth is stranger than fiction,'' and bee stories are sometimes stranger than fish stories.

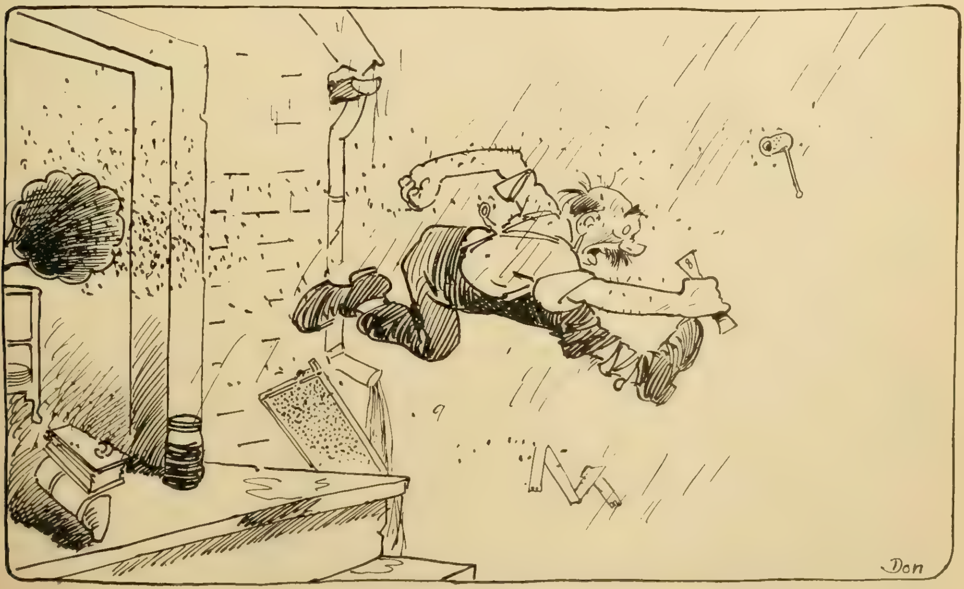
It was a wet and gloomy day in the fore part of August. The outdoors was not very inviting to either man or bees. Consequently my bees were hanging pretty close to their hives, and I was doing likewise to my shack. As evening began to encroach upon the day (like some beekepers do upon another's territory) I began to feel melancholy.

No wonder, then, all alone in the wilderness as I was, that I turned to my phonograph for solace. There it was in the corner; at least there was the top of it peering above a conglomeration of Danz. supers, hive bodies, and Hoffman frames. Ten minutes' work cleared this away and saw me drinking in the music as it poured forth from the latest records.

I leaned back in my chair and puffed contentment from my pipe. A new record, ''When the Bees Are Makin' Honey,'' was beginning to grind. It wasn't very appropriate for the day, as I soon found out.

Ping, ping! First on the nose; then above the left eye; one on the right ear; two on the chin, and I lost count. It was a real live record, but the bees did not approve of it. Some day during the clover flow the little varmints must have swarmed in thru my open window and lodged in the sound box of my phonograph.

Lansing, Iowa. Ben Kelleher.



Ben Kelleher Moved Out—Promptly.

GLEANED BY ASKING

Editors

Question.—I am about to purchase an apiary, but the bees are hybrids. Are they as good as Italians, and will they do as well under favorable conditions.

L. D. Strauss.
California.

Answer.—If the colonies are in good condition and free from disease, you need not hesitate about purchasing this apiary because the bees are hybrids. So far as honey-gathering is concerned these hybrids may be either poorer or better than Italians and unless they are now several generations from the first cross there will probably not be much difference in honey-gathering qualities between these hybrids and pure Italians. After several generations, however, they may deteriorate rapidly. The greatest danger is in their poor resistance to European foul brood, and before purchasing them you should examine them carefully to see if this disease is present. In California this month is a good time to look for the disease, for it is usually at its worst during the heaviest brood-rearing in the spring. If the colonies should be found badly infected with European foul brood at this time of the year, of course they may not be worth much. If you purchase these bees it will be well for you to Italianize them this season, if for no other reason than as a precaution against European foul brood.

RENT FOR OUT-APIARIES.

Question.—What is the usual custom in paying for the privilege of placing colonies of bees on another's property, as in establishing out-apiaries?

Connecticut. G. B. Chase.

Answer.—This will vary according to circumstances. In some cases, fruit-growers are not only willing to furnish a location for the out-apiary without charge, but are willing in addition to pay the beekeeper a fixed sum on account of the benefit from the bees in better pollination of the fruit. On the other hand, beekeepers in the West sometimes pay as high as $50 to $100 for the exclusive right to locate an apiary on a large ranch where alfalfa is grown extensively. Probably a fair price for a good location is $10 to $15 per year, with a little honey thrown in. In any case the out-apiary should be located some distance away from the farm house and away from cultivated fields if possible, preferably on pasture land. The beekeeper should take special care not to leave gates open or permit the presence of the bees on the farm to annoy the owner of the farm in any way.

SPREADING BROOD AND STIMULATIVE FEEDING.

Question.—Which plan is best, spreading the brood and stimulative feeding, or the "rich in honey" plan for spring management?

Pennsylvania. Charles B. Bickel.

Answer.—Spreading the combs of brood apart and inserting empty combs taken from the outside of the hive was advocated by some leading beekeepers 25 or 30 years ago, but the practice has been almost completely abandoned by commercial honey-producers. In the hands of the inexperienced it is a dangerous procedure, and in the hands of the expert it is of doubtful value. About the only time that it pays to do this is when a colony becomes "honey-bound" in the spring so the queen is unable to expand the brood-nest on account of a barrier of honey. Sometimes poor combs or pollen-clogged combs may become barriers in the way of the expansion of the brood area. In such cases a safe way is to take away this barrier and insert an empty comb adjacent to the outside frame of brood instead of in the middle of the brood-nest.

In regard to stimulative feeding, this, too, is not practiced now as much as formerly, since in most cases, especially in the eastern portion of the United States, but little is gained in brood-rearing by stimulative feeding over the presence of an abundance of honey in the hives. The inclination to rear brood extensively is very strong in the spring, and usually if the bees have plenty of honey they need no additional urging to do their best. There are some exceptions to this in the West, in which beekeepers sometimes break down the cappings of sealed honey or transpose combs of honey to the lower hive-body to induce the bees to move some of the honey to stimulate brood-rearing. When stimulative feeding is practiced it should not be begun until three or four weeks previous to the beginning of the honey flow, and should be continued until the beginning of the honey flow if no honey is coming in from minor sources.

SHALLOW SUPERS FOR BROOD-REARING.

Questions.—(1) Will a shallow extracting super provide enough extra space for spring brood-rearing when using the ten-frame hive? (2) Should the queen be allowed this extra breeding space all the season or should the excluder be put on the lower hive-body?

R. H. Grell.
Iowa.

Answers.—(1) If a shallow extracting super is used in addition to ten good combs in the regular brood-chamber, these combs having good worker-cells practically to the top-bar so that almost the entire comb can be used for brood-rearing, there should be sufficient brood-rearing space for the most prolific queens even when the shallow extracting super is partly filled with honey. The 10 Langstroth frames, if free from honey, contain nearly 70,000 cells for brood if the combs are nearly perfect, but in practice this much brood is probably never found in a regular 10-frame hive. (2) It is better to confine the queen to the lower hive-body soon after the beginning of the main honey flow in order to have the shallow extracting super well filled with honey at the close of the season to insure plenty of stores for the colony.

FROST IN ENTRANCE.

Question.—This morning the ⅜-inch entrance hole of one of the colonies in a double winter case was nearly closed with frost. There was just a little hole about ⅛ inch in diameter that remained open. What does this frost indicate?

New York. Cordelia Timmerman.

Answer.—This frost in the entrance indicates that the moisture given off by the bees is passing out of the hive thru the entrance in the form of vapor. The warmer air within the hive has a greater capacity for moisture than the colder air outside. The moisture can be held in vapor form until it becomes chilled at the entrance when some of it condenses and frost is formed. Frost in the entrance would indicate that your hives are well packed, for otherwise it would be formed inside the hive.

CONFINING BEES IN CELLAR.

Question.—I have cages on the hives in the cellar, and at present several colonies are raging and roaring, seeming to want to get out. They cluster outside in the cages and fill them tho the temperature in the cellar is 40 degrees. What do you think makes them act so and what would you do?

South Dakota. E. O. Mashamer.

Answer.—When bees are confined to their hives they may be expected to become restless and try to find some way to get out. As long as the bees do not realize that they can not escape, they may remain quiet: but, when some of the old worn-out bees attempt to leave the hive and find that they can not do so, the colony becomes greatly disturbed and many bees rush out into the cage in their attempt to escape. If the cage were larger or the colony weaker, there would be less trouble, but it is not best to try to confine bees to their hives in this way. The cages should be removed at once, and, if the disturbance has not been of too long standing, the bees may quiet down again. If the stores are good and the cellar temperature is right, only those bees that are too old to be of any further use to the colony should leave the hives during the winter, and it is better to leave the entrances open so these old bees can escape.

USE OF POLLEN.

Question.—What is the value of pollen to bees?

Louisiana. G. D. Verchee.

Answer.—Pollen is used by the nurse bees in elaborating the larval food, and may be used to some extent by other adult bees. Pollen contains the tissue-building elements and is therefore needed in the growth of larvae, while honey contains energy-producing elements. Without pollen brood-rearing would not be possible, and it may be important as a small part of the food for adult bees, but they cannot live on pollen alone.

ADVANTAGE OF TWO-STORY HIVE.

Question.—What are the advantages of using the 10-frame hive two stories high? R. C.

Montana.

Answer.—A second story for brood-rearing is advantageous in the spring, since a single story may not be large enough for the full development of strong colonies. The second story should contain an abundance of honey to insure extensive brood-rearing and at the same time supply additional room for the most prolific queens. In your climate it may be better to reduce your colonies to a single brood-chamber for winter, then give the second hive-body supplied with honey and some empty comb when these are needed in the spring. When producing extracted honey, by permitting the queen to have free range of two brood-chambers previous to the honey flow the tendency to swarm is greatly reduced. Later the queen should be confined to the lower hive-body.

BEES ON SHARES.

Question.—Within a radius of four miles there are three or four men who have asked me to take care of their bees. Will you please tell me what would be a fair share of the honey and increase, the owner paying for all the supplies?

Ohio. S. C. Botdorf.

Answer.—Uusually in such cases the owner and the beekeper divide the marketable honey and wax equally, and share equally the expense for containers when extracted honey is produced, and for sections, foundation, and shipping cases when comb honey is produced. Increase, if any, usually belongs to the owner. If no surplus honey is secured, the owner usually agrees to pay the beekeeper a sum previously agreed upon. If feeding becomes necessary, the owner provides the sugar for this purpose, the beekeeper doing the feeding.

SENDING SAMPLES OF BROOD DISEASE.

Question.—Where and how can I ship comb for examination for foul brood? If by mail, how should it be packed? R. M. Hamilton.

Pennsylvania.

Answer.—Samples of comb in which one of the brood diseases is suspected should be sent for diagnosis to the Bureau of Entomology, Division of Bee Culture, Washington, D. C. These samples should be sent by mail, packed in a small wooden box. An empty cigar box will do very well for this purpose. The comb should not be wrapped, but should simply be fitted into the box. Tin cans or tin boxes should not be used for sending samples, since the comb is liable to become mouldy if sent in tight containers, thus rendering them unfit for diagnosis. In selecting the sample to be sent, choose that portion of the comb which contains the greatest number of dead larvae or pupae and cut out a piece to fit the box. No honey should be included in the sample, since this would, in all probability, leak out and damage other mail matter. A small wooden box for mailing samples of diseased brood may be had by writing to the Bureau of Entomology at Washington. Great care should be taken when preparing samples of diseased brood in this way, to prevent any bees having access to them, thus spreading the disease to other colonies.

TALKS TO BEGINNERS

By the Editor

IN the southern States the beginner who is able to purchase colonies of bees locally has probably already come into possession of his colonies and moved them home. When full colonies are purchased locally they should be moved early in the spring before they become very populous and before warm weather, for there is less danger of injuring them at that time. The bees should be brought home not later than some time this month in most parts of the South, and not later than about the first of May in the North. If the bees can not be purchased locally and it becomes necessary to purchase them from a distance thru a dealer, they will, of course, not be shipped until later.

The beekeeper from whom the colonies are purchased should prepare them for transportation by closing the entrance with a wire screen and by fastening the bottom and cover to the hive so no bees can escape. The hives should be closed, either in the evening after they have all returned from the fields or during a day when it is too cold or rainy for them to fly; otherwise some of the workers would be left behind when the colony is moved away, and at this season it is important that none be lost, for these bees have the important responsibility of raising the great horde of workers which should be ready to harvest a crop of honey later when the flowers begin to yield nectar in abundance. It has been estimated that for each worker bee in the hive in the early spring there should be at least five young bees reared within less than two months. So the loss of one worker (at that time) may mean a reduction of five workers when the real work of the season begins.

Location of the Hives.

If the bees are to be kept in a village or city lot, there is usually an out-of-the-way nook somewhere in the back yard or garden which may be dedicated to the bees. If on a farm, the bees can usually be located in a corner of the orchard. The city dweller may find it necessary to place his colonies in the attic of his dwelling, which can be done by providing an opening in the siding thru which the bees may pass from the entrance of the hive.

While the hives may be located near a path or near the back door usually without the bees molesting persons passing by, it is much better to locate them some distance away where there is less chance of trouble. In this connection it should be mentioned that some strains of bees are much more inclined to sting than others, and those who keep bees on small lots in villages and cities where they may molest the neighbors should, if possible, keep only a gentle strain of Italian bees.

Wherever the bees are located the hives should be sheltered from cold winds by a fence, bushes, buildings, or any kind of protection that may be available. While a shady nook may be advantageous during the heat of the day, the hives should not be located where they will be in the shade throut the entire day. It is usually better to have the hives in the full sunshine during the spring, and when shade is needed later they can be covered with wide boards to protect them from the hot sun.

Most beekeepers prefer to have the entrances of the hives either toward the south, southeast, or east; but if well protected from cold winds, this is not essential. A southern or southeastern slope is better than a northern or western slope for the location of an apiary.

The hives may be placed upon four bricks, wooden blocks, or upon the regular hive stands made by nailing together four narrow boards to form a rim from three to six inches high. This is to raise the floor of the hive off the ground to keep it dry. The hives should be level from side to side, or crosswise of the combs, but should be tipped slightly forward to prevent water from standing on the floor after a driving rain.

As soon as the bees are brought home and the hives are located where they are to remain permanently the screen which closes the entrance should be removed. The beginner may think, since the bees have been moved home during the night or on a day too cold for them to fly, that the entrance need not be opened until the next day, but it will be better to do this as soon as possible.

How Many Colonies for Beginners?

The advice usually given to beginners is to start with one or two colonies and build up the number as experience is acquired. The reason for this is that it takes time to learn the trick of handling the bees and also to work out a system of management best suited to the particular locality. While much can be learned from a season's management of a single colony, two or three colonies would be better; and there is no reason why the ambitious beginner should not start with a dozen or more colonies, if he has plenty of enthusiasm and a little time to devote to the bees.

The Modern Beehive and Its Parts.

There are so many things which the beginner should be told on these pages before June that it would be folly to use precious space here to describe and illustrate the modern beehive, when this has already been so well done in the catalogs put out by dealers in beekeepers' supplies. The beginner will find in the catalog illustrations of the modern beehive partially dissected, showing the various parts of the hive, and giving the name of each part; and on the same pages will be found explanatory notes, telling the purpose of each of the parts. These should be studied carefully, for a correct understanding of the modern beehive, its parts, their purpose and relative position is of great importance to beginners. This is true also as to all the apparatus used by beekeepers, for these are well illustrated and described in the catalogs which can be had for the asking by writing to any dealer in beekeepers' supplies. By consulting the advertising pages of this journal the address of the leading dealers in bee supplies can be found.

It is not necessary for the beginner to purchase many of the articles listed in the catalog of the supply dealer; but certain additional equipment is necessary unless it was purchased with the bees. These should be obtained without delay, for if they must be ordered from a distance it will take some time for them to be shipped and assembled ready for use.

Comb Honey or Extracted Honey.

If the ''supers'' were not included with the equipment when the bees were purchased it will be necessary to provide from one to four of these for each colony (spring count). These supers are the extra chambers which are placed on top of the hive for the storage of the ''surplus'' honey. The kind of supers to be provided depends upon the kind of honey that is to be produced—whether comb honey or extracted honey. Comb honey is usually built in the small boxes or sections in the regular comb-honey super, tho for home use it may be built in the shallow frames in a shallow extracting super. Extracted honey is stored by the bees either in the combs of the shallow extracting super or full-depth combs of the same dimensions as the combs in the brood-chamber. These combs of honey are removed and the honey extracted by means of the honey-extractor, and finally they are returned to the bees to be filled again.

Most beginners produce comb honey at first in order to avoid purchasing an extractor the first year; but comb-honey production is really a more difficult undertaking than extracted-honey production because of the greater trouble from swarming and the greater difficulty in inducing the bees to work in the supers with the greatest vigor. More extracted honey can be produced from each colony than comb honey—usually, in the case of beginners, twice as much. On the other hand, comb-honey production is more fascinating to most beginners, and experience is usually gained much more rapidly when comb honey is produced. In addition to this, in most localities the colonies are in better condition at the close of the season when comb honey is produced.

Chunk Comb Honey for Home Use.

If the honey is for home use, it is not necessary to have it stored in the small boxes or sections as when the honey is to be sold in the markets, and for this purpose the shallow extracting supers are excellent. The bees usually work better in these shallow extracting supers than they do in the small boxes of the comb-honey supers. After the shallow extracting frames are filled with honey the combs can be cut out as the honey is used and the frames used over again the next year, while the sections are usually used but once.

In some of the southern States considerable honey is produced for the market in this way, the combs of honey being cut out of the frames and packed in tin containers for the market. This plan has the further advantage that the same supers may be used for extracted honey, if it is found desirable later to change to extracted-honey production. In producing this chunk honey, the wires are omitted from the shallow frames in the supers, but a full sheet of a light grade of foundation should be used in each frame.

Whatever the kind of honey to be produced, whether comb honey in sections, chunk comb honey in shallow extracting frames, or extracted honey in the full-depth frames, the beginner should provide from two to four comb-honey supers for each colony in the spring, or one or two full-depth extracting supers, if extracted honey is to be produced. In some seasons double this number of supers will be needed, and it is better to have too many than too few. Full sheets of foundation should be used in all sections and all extracting frames, the particular grade of foundation for each purpose being specified in the bee-supply dealer's catalog.

Additional Equipment.

In addition to the supers the beginner may need some one-story hives for new swarms, especially if comb honey is to be produced, but never more than one new hive for each colony (spring count), and one new hive for every two colonies (spring count) should be enough.

If extracted honey is to be produced a queen-excluder will be needed for each colony to exclude the queen from the supers, but queen-excluders are not needed when comb honey in sections is being produced.

In addition to the hives and supers a good smoker and a bee-veil are absolutely necessary for the beginner as well as for the professional beekeeper. A pair of good bee-gloves will afford a timid beginner great comfort, and some sort of hive-tool will be needed. It is assumed that the necessary books and bulletins have already been procured.

JUST NEWS

Editors

THE West Virginia Beekeepers' Association will hold a meeting at Charleston, West Virginia, on March 25-26. Editor Geo. S. Demuth is expecting to attend. Further particulars in regard to this meeting may be had by writing to the Secretary, Will C. Griffith, Elm Grove, West Va.

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The South Dakota Beekeepers' Association will hold its next meeting at Vermilion, S. D., on March 8 and 9. L. A. Syverud of Yankton, S. D., is secretary of this association.

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The British Bee Journal reports the value of honey imported into the United Kingdom during the month of December, 1920, as £10,333, from a return furnished by the Statistical office, H. M. Customs.

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The Beekeepers Item comes out in a new dress for 1921, having changed to magazine form and added a cover. It is now a 32-page magazine and is filled with good matter. The price has been increased to $1.00 per year.

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The 32nd annual meeting of the California State Beekeepers' Association will be held at Oakland, Cal., March 2, 3, 4, 5. An elaborate program is being prepared for this meeting and a long list of notables are listed as speakers. Editor E. R. Root is expected to attend this meeting.

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A meeting of the Montana State Beekeepers' Association was held at Billings, Mont., on Jan. 25-26. The big feature of this meeting was a discussion of the proposed foul brood law for the State, which was introduced in the Legislature immediately after the close of the meeting.

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The annual meeting of the Southern Minnesota and Western Wisconsin Beekeepers' Association will be held in the courthouse at Winona, Minn., on Thursday and Friday, March 3 and 4. An excellent program of papers and talks on live subjects has been arranged for this meeting. Ozra S. Holland of Winona is secretary of this association.

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An insect, which for some years has been known to occur in the citrus groves of India, has recently appeared in Cuba, the Panama Canal Zone, the Republic of Panama, and Costa Rica. There is danger, according to the Bureau of Entomology, United States Department of Agriculture, that the black fly, **aleurocanthus woglumi**, may invade the United States from these New World colonies, but careful investigations conducted by the bureau specialists in the Canal Zone fail to disclose any citrus trees that have been killed by it. The Canal Zone has peculiar climatic conditions, however, which may limit the ravages of the new pest, and it is possible that it will add a heavy burden to the citrus grower if it becomes established in the United States.

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The Department of Agriculture Bill now being considered by the State Legislature of Michigan, if passed, will take the bee-inspection service of that State out of the hands of the university and put it directly under the control of the governor. From this distance, at least, this change looks like a step backward for the inspection service of Michigan.

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The report of the State Inspector of Apiaries of the State of Utah for 1920 contains an estimate of the honey produced in that State in 1920. The data are given by counties and from a total of 39,131 colonies 3,002,245 pounds of honey was produced, this being an average of about 76 pounds per colony. Ten per cent of this was comb honey, and 90 per cent extracted honey. Duchesne County, with 7,101 colonies, shows the highest average yield per colony, as well as the greatest number of colonies, the average yield being 120 pounds per colony.

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At Auburn, Me., on Feb. 15, the Maine State Beekeepers' Association was organized. Lester W. Longfellow, Hallowell, Me., was elected president, and F. L. Mason, Mechanic Falls, was elected secretary. The immediate object of the association is that there may be an organized effort in support of a foul brood law to come before this session of the legislature. The first annual meeting of the new State Association will be on March 30 at Orono. Dr. E. F. Phillips of the Bureau of Entomology is scheduled as one of the speakers at this meeting.

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Two short courses for beekeepers were given by the United States Bureau of Entomology, one in co-operation with the Ohio State University at Columbus, O., Jan. 31 to Feb. 4, and the other in co-operation with the New York State College of Agriculture at Ithaca, N. Y. Both were well attended and great interest was manifested. Dr. E. F. Phillips of the Bureau of Entomology carried his usual course of lectures thruout the week in each of these schools. His work was supplemented by other speakers, whose topics were chosen to fit in with the main series of lectures. It is to be regretted that more of these short courses could not be given during the winter.

BEES, MEN AND THINGS

(You may find it here)

THE season just closed has been an educational one and bees in our locality are in better shape than they have been for years; the assistance of our local Deputy Inspector of Apiaries, Mr. Logan, and instructive articles in Gleanings and American Bee Journal, as well as the hearty co-operation of local beekeepers, made it possible for our bees being in such fine shape this fall.''—Alten L. Logan, Madison County, Ills.

''In a recent conversation with a bee-supply dealer who covers Michigan territory he said that his business in tin cans of an average size of five pounds had increased to 40 times what it was ten years ago, and that most of that increase has been very recently. It shows that Michigan beekeepers are making themselves independent of the wholesale market by cultivating a private trade. This is the most hopeful sign of progress that we have seen for some time.''—B. F. Kindig, Ingham County, Mich.

''In the February Gleanings, J. E. Crane wants to know if any one has melted the cappings from the wax press described by Mr. Holtermann. I made a press with a two-inch screw and use an iron bar for turning down. I use a solar wax-extractor and get equal pounds of wax and honey from a 20 to 25 pound cheese. It would not vary more than a pound either way.''—Fred P. Jansen, Montgomery County, N. Y.

''A man at Glen Summit Springs, Pa., having occasion to remove a bottom-board from one of his hives, noticed a mound of wax, and upon breaking it open a little discovered a dead mouse in it. The mouse in its efforts to escape had probably stirred up the bees, which stung it to death; and in order to prevent the odor from the dead mouse contaminating the hive and honey they had hermetically sealed it in.''—Albert Williams, Jr., Luzerne County, Pa.

''Temperature has been just too cool for the bees to have a good flight for several weeks. Today (Feb. 14) they are bringing in pollen from maple.''—O. Bromfield, Jefferson County, Ky.

''State Bee Specialist C. L. Sams says there are good prospects for an exceptionally large amount of transferrence of the bees this spring from gum and box hives to the Standard hives. He is finding a steady growth in interest among the beekeepers of the old-fashion sort. While many are 'sot in their ways' and are not turning readily to the improved methods, their eyes are being opened by demonstrations all about them and they are being forced to admit that the 'new-fangled' methods are the best.''—W. J. Martin, New Hanover County, N. C.

''The weather in this portion of the State, Mills County, has been extremely mild so far, and bees are in excellent condition. I examined a portion of my apiary and found brood-rearing coming on nicely. I found plenty of sealed brood and eggs and young bees just emerging from the cells. They have plenty of stores of sealed honey of fine quality. The bees are far above the average of this time last year in this section. The prospects for a good honey flow are excellent for the coming season.''—John W. Hendrick, Mills County, Texas.

''About 10 years ago there were in the whole island no more than 200 commercial beehives and a few wild colonies. The production per colony was much more than a barrel (50 gallons), and the swarming was something to worry about. The native blacks were of two kinds, one big and rather tame, and the other fierce and very small. There were also a small variety that looked like degenerated Italians and were intolerably fierce and very small. The superiority of the Italians was remarkably shown some years afterwards by the complete disappearance of all wild bees. Today, on account of the high prices of honey and competition, everybody tries to make the bees produce honey to the limit by extracting as much as possible even in the brood-chamber, not worrying about a possible death by starvation. This close extracting, the introduction of pure American-Italian stock and the superabundance of bees everywhere, all combined, help to produce almost non-swarming colonies.''—C. Vives-Bazan, Porto Rico.

''Bill Mellvir. Dear Bill: I read with real dismay what trials you had Convention Day. And all because old Jimmy Jones became so drunk on his own tones he would not stop for sigh nor tear, and you — you turned the other ear! I'm sorry, Bill, as I can be, you couldn't come to Tennessee; for it would do your sick soul good to see how speakers rose and stood and said their say and sat down quick — 'twas that time-limit turned the trick, all printed out in minutes, five, fifteen or ten — and Man Alive! — they poured out wisdom, plan and text before 'twas time to holler Next! And there was question and debate, and still the program held its gait. ''Speak and let speak!'' this rule dethrones convention tyrants like Jim Jones, and gives a modest man like Jinks a chance to tell folks what he thinks of getting honey by the ton and maybe tell 'em how it's done. But Bill, come down to Tennessee — choose any subject, so it's bee; behavior, packing, nectar-flowers — and you shall talk two solid hours! Grace Allen.

Nashville, Tenn.

NOTES OF TRAVEL

A. I. Root

When we started out, I suggested we could make pretty near 200 miles a day, but Huber said altho I might make it the first day, the next I would be pretty nearly used up, especially for a man over 80. Well, I rode about 1800 miles in 13 days' travel, and felt better the last day than I did the first, and *gained 8 pounds in weight*. As we had unusually cold, and sometimes stormy weather, the little stove, described on page 754 of December Gleanings, proved a little gem indeed. I don't think I could have kept warm without it. Below I am going to submit notes to Mrs. Root on postal cards:

Raleigh, N. C., Nov. 13.—We have just visited Mr. C. L. Sams, employed by the State and the United States to develop bee culture. His wife wanted to meet the author of the ''Home Papers.'' She and her four daughters sang, ''From Sinking Sand, *He* lifted me'' (violin and piano), and it ''lifted me. ''Surely goodness and mercy will follow me all the days of my life,'' etc.

Camden, S. C., Nov. 15.—Last night we stopped at a rather fine hotel, where they *never lock a door* on the premises, and they don't have things stolen, not even an automobile (?).

Live Oak, Fla., Nov. 18.—Between Augusta and Macon, Ga., we saw *miles* of peach orchards, some of them in very fine condition. Frost enough to kill sweet potatoes.

Palatka, Nov. 20.—We had a most pleasant visit with Profs. Rolfs and Newell at Gainesville Experiment Station. Ernest had so many points to compare, we could hardly get away. They have about the prettiest little apiary I ever saw right in a thick, dense wood. It has been so cold until today that I have worn my sweater every minute. I am getting very anxious to reach ''home,'' and get to work.

Crescent City, Nov. 21.—We attended church and Sunday school in Palatka, and this afternoon passed thru Huntington and stopped about an hour to look over our 160 acres. Huntington has run down, and seems almost deserted, but there are some of the finest Florida residences I ever saw *near* there, and also some of the finest orange groves.

Lakeland, Nov. 23.—We have been thru some of the most beautiful and largest lettuce farms near Hastings I ever saw, and just *miles* of orange trees loaded with fruit. We are only 25 miles from Tampa, and expect to be ''home'' tonight. Yesterday I was up at 15 minutes of 5 and had *no nap at all* until 7 p. m.

''Out in the wilderness,'' somewhere near the line between Georgia and Florida, I saw a little tree close by the roadside loaded with most beautiful, luscious-looking fruit. We stopped, and behold, it was wild persimmons, ''wasting their sweetness on the desert air.'' I began eating until Ernest demanded a stop. You see he had ''contracted'' to ''deliver me'' at our Florida home sound and well. I wanted to load a lot in the ''Dodge,'' but he declared we had no time to spare before night. The delicious fruit hung so low it could be easily picked from the ground. and was close up to a well-traveled highway. I would like to ask my good friend Reasoner and other nurserymen why something more is not done to develop and disseminate some of the best of our wild persimmons growing more or less from Missouri to Georgia.

ELECTRIC WINDMILLS.

This is the third winter we have lighted our home and run our electric auto by wind power, and there has heretofore been very little trouble from lack of wind; but just now (Jan. 12) we have had much less wind than during the two previous winters. To increase our lack, the evening that Ernest and I arrived, of course, I had to ''trot out'' the new electric devices. The heater was one of the things exhibited, and, altho no heat was needed, the plug was put in to show how quickly it would be red-hot, and then pushed back under the table and forgotten. After thirteen hours my 16-cell house batteries were down to the last limit. From that time to this, we haven't had enough wind to run the auto at its best, and light the house fully. Now for lighting the home and other light work the outfit made by the Wind Electric Corporation, Wyndmere, North Dakota, is all right; but, if you want to run an electric auto also, in most localities, there should be current available from some other source when there happens to be several days with no wind. A very cheap outfit would do all right for those rare times when the wind doesn't happen to blow for several days at a time.

Using electricity to produce *heat*, takes much more current than for light or mechanical work, and where used for cooking or warming current should be promptly cut off just as quickly as it can possibly be dispensed with. Even running an auto does not pull down the current, like the little heater I have mentioned. We use the auto for 5 to 10 miles almost every day, and, of course, the current used depends on the load carried.

BEE CULTURE IN ITALY.

Inasmuch as our Italian bees are proving to be such a help not only to America, but perhaps to the whole wide world, it is a little strange that we have never heard very much in regard to what the Italian bees do in their native home. The inclosed clipping from the Cleveland Plain Dealer, in view of this, should be interesting:

> BEES TO AID SUGAR LACK.
>
> Italy Gives Rail Employes Unique Job.
>
> ROME.—Italy is devising means to alleviate the beet sugar shortage. She has been urged to put more bees at work producing honey.
>
> Italy in 1917 had only 67,000 miles of railways, and at regular intervals along the lines are little houses where the railway employes, signalmen, track walkers, and repairmen live. The manager of the National Institute for Agrarian Assistance recently recommended that they each be given a hive of bees.
>
> In conformity with the suggestion the experiment is to be begun at once on the lines in the province of Rome; and, if successful, it will be extended to all the railways of Italy.

The above, if carried out, will certainly result in a tremendous boost to bee culture in Italy. If we knew how many miles apart these stations were to be, we could tell a little better how many bees it would take to cover the whole 67,000 miles. I find we have now only eight subscribers in Italy. Can not one or more of these eight subscribers tell us a little more about it? And, by the way, can not the suggestion be carried out, more or less, here, in our own country? If each one of our thousand railway stations, say in country places and the little towns, were once started in bee culture, it might result in saving many tons of nature's sweets.

A. I. ROOT AS HIS DAUGHTER SEES HIM.

The Farm Journal for January, on its page of ''Workers and Work,'' published an article ''unbeknownst'' to Mr. A. I. Root, under these headlines: ''One of the Farm Journal's Oldest Friends, Amos I. Root, the Bee Man.'' The author was his daughter, Mrs. Constance Root Boyden—in the old days her father's ''Blue Eyes.'' The editor of Gleanings makes bold to publish this well-done sketch of the father without consulting either the subject or the author of it. Here it is:

''My father might be described as a man who has never been without a hobby. Perhaps this explains why at eighty years of age he is mentally keen and has the enthusiasm and zest for life of a boy, altho always he has been handicapped by a frail constitution which necessitated his husbanding his health.

''When only sixteen his hobby was electricity, and he even went about giving lectures on what was then a little understood subject. Later when he had a growing business as manufacturing jeweler, he happened to notice a swarm of bees going overhead, and paid a workman a small sum to capture them for him.

''That little incident altered the course of his whole life, and shaped the lives of all his descendants to the third generation. From that time on bees became his hobby, and he gave all his spare time to their study. Since the books of that period did not give him all the information he wished, he studied his pets at first hand to such purpose that he afterward wrote the well-known ''A B C of Bee Culture.''

''But electricity and bees were by no means his only hobbies. He was one of the first keenly interested in aviation, being a confidant and friend of the Wright Brothers when they were making their first secret attempts at flying.

''And he has had a lifelong love for out-of-door work and ''seeing things grow,'' both in his garden and chicken yard. You will notice I use the expression ''out-of-door work.'' If father ever deliberately started out to play, I never knew it. He would probably not know a golf stick from a tennis racquet, nor has he any first-hand acquaintance with a fish-pole or gun. And yet, I am not sure but that he has taken more recreation than any other man I know. You see much of his work is recreation because he works along the lines of his hobbies. He can extract more pleasure from a combination of hoe, garden soil, and growing crops than other men can find on ideal links with the most expensive golf sticks.

''His latest hobby is to generate electricity by wind power. By windmills, at his little Florida home, he charges storage batteries and thus runs a little electric runabout and lights his house. He likes to mystify small boys by telling them his automobile runs by wind.

''Although father's life-work has seemed guided by his hobbies, there is a dominating principle over all, and that is, and always has been, his great desire to serve humanity.

''Here is a rather strange fact about father; he has never been employed by any other man, not even for one day.

''Now, at eighty years age, father is a busy, happy optimist.''

Mr. A. I. Root.

I have just read your Home Department in August Gleanings, and I want to let you know how much I value it. As I am a beekeeper I read Gleanings from the front cover to the back, but your department comes first with me. I consider your department worth more than Gleanings cost. Let them that want to criticise, do so; but remember that you are doing God's work, and that there are far more that appreciate it then there are that criticise.

EUGENE HOLLOWAY.

Marietta, Okla., Aug. 3, 1920.

Classified Advertisements

Notices will be inserted in these classified columns for 30c per line. Advertisements intended for this department cannot be less than two lines, and you must say you want your advertisement in the classified column or we will not be responsible for errors. Copy should be received by 15th of preceding month to insure insertion.

REGULAR ADVERTISEMENTS DISCONTINUED IN GOOD STANDING.

(Temporary advertisers and advertisers of small lots, when discontinued, are not here listed. It is only regular advertisers of regular lines who are here listed when their advertisements are discontinued when they are in good standing.)

Western Honey Producers, Joe C. Weaver, A. S. Tedman, R. V. Stearns, Seward P. Stanley, Geo. M. Sowarby, Chas. Sharp, J. Ford Sempers, W. T. Perdue & Sons, H. S. Ostrander, L. C. Mayeux, Michigan Honey Producers, J. E. Harris, Jas. Hanke, H. B. Gable, Jes Dalton, J. H. Corwin, Colo. Honey Prod. Asso., Albert Borning, J. D. Beals, Woodlawn Nurseries, Heller Bros., Progress Nurseries, Pullford Co.

HONEY AND WAX FOR SALE.

FOR SALE—Honey in 5 and 60 pound cans.
Van Wyngarden Bros., Hebron, Ind.

FOR SALE—Clover and buckwheat honey in 60-lb. cans. Bert Smith, Romulus, N. Y.

FOR SALE—Choice clover-basswood blend honey in new 60-lb. cans. J. N. Harris, St. Louis, Mich.

FOR SALE—25 barrels, amber extracted honey, 12½c per pound. H. G. Quirin, Bellevue, Ohio.

FOR SALE—Choice white clover honey in 60-lb. cans—none finer. J. F. Moore, Tiffin, Ohio.

FOR SALE—White-clover comb honey. Fancy, 800, No. 1,775. W. L. Ritter, Genoa, Ills.

FOR SALE—Finest-quality extracted buckwheat honey in 60-lb. cans. Chas. Sharp, Romulus, N. Y.

TWENTY-FIVE cases clover-basswood blend, new 60-lb. cans, two in case. Sample 20c.
W. B. Crane, McComb, Ohio.

FOR SALE—A No. 1 white-clover extracted honey in 60-lb. cans, 2 cans per case. State how much you can use and I will quote on same.
L. S. Griggs, 711 Avon St., Flint, Mich.

FOR SALE—White clover honey, almost water white. Put up in new 60-lb. tin cans, two to the case. Write for prices.
D. R. Townsend, Northstar, Mich.

FOR SALE—Finest Michigan raspberry, basswood, and clover honey in 60-lb. cans, 20c per pound. Heartsease, aster, 18c. Free sample.
W. A. Latshaw Co., Clarion, Mich.

FOR SALE—White honey in 60-lb. cans, sample and price on request. Also white clover comb, 24 sections to case. The A. I. Root Co., Inc., 23 Leonard St., New York City.

FOR SALE—10,000 lbs. A1 quality white sweet clover honey, in new 60-lb. cans. Will sell in quantities to suit. Sample free.
W. D. Achord, Fitzpatrick, Ala.

FOR SALE—Clover, basswood or buckwheat honey, comb and extracted, by the case, ton, or carload. Let me supply your wants with this fine N. Y. State honey. C. B. Howard, Geneva, N. Y.

FOR SALE—White honey, 15c a lb.; L. A. alfalfa, 14c, in two 60-lb. cans; Chilian in 165-lb. kegs, 10c; light amber honey in 50-gal. bbls., 80c a gal. Beeswax, 30c a lb.
Walter C. Morris, 105 Hudson St., New York City.

FOR SALE—Choice white-clover extracted honey, $20.00 per case of two 60-lb. cans f. o. b. Holgate.
Noah Bordner, Holgate, Ohio.

FOR SALE—Well-ripened, thick and rich white-aster honey in 120-lb cases at 18c f. o. b. Brooksville, Ky. Sample 25c. H. C. Lee, Brooksville, Ky.

FOR SALE—Extra choice extracted white clover honey, put up in new 60-lb. cans and 5-lb. pails. Sample, 20c, same to apply on first order.
David Running, Filion, Mich.

FOR SALE—2000 lbs. Lancaster County best clover honey. None better. In packages to suit. Beeswax; also grafting wax.
W. O. Hershey, Landisville, Pa.

FOR SALE—Choice clover extracted honey in 60-lb. cans, $20.00 per case of two cans. Write for prices on large quantities. 50 cases of No. 1 comb honey. J. D. Beals, Oto, Iowa.

FOR SALE—3000 lbs. of well-ripened clover honey at 20c per lb.; 12,000 lbs. of No. 1 white aster honey at 15c per lb., put up in 60-lb. cans f. o. b. Brooksville, Ky. Sample 25c.
W. B. Wallin, Brooksville, Ky.

FOR SALE—Well-ripened extracted clover honey, 20c per pound; buckwheat and dark amber, 17c, two 60-lb. cans to case. Clover in 5-lb. pails, $1.25 per pail; buckwheat and amber, $1.00 per pail, packed 12 pails to case, or 30 to 50 pails to barrel. H. G. Quirin, Bellevue, Ohio.

HONEY FOR SALE—Immediate shipment f. o. b. N. Y., Calif. white orange, 60-lb. tins, 19c lb.; Calif. white sage, 60-lb. tins, 16c lb.; white sweet clover, 60-lb. tins, 14c lb.; Calif. L. A. sage, 60-lb. tins, 13c lb.; West Indian L. A., 60-lb. tins, 10c lb.; West Indian L. A., 10-lb. tins, 6 per case, 15c lb. Hoffman & Hauck, Inc., Woodhaven, N. Y.

FOR SALE—Clover extracted honey of unsurpassed quality; new cans and cases, prompt shipment. You will be pleased with "Townsend's quality" extracted honey. Not a single pound extracted until long after the flow was over; thus the quality. Would advise intending purchasers to order early, as we have only a half crop. Address with remittance.
E. D. Townsend & Sons, Northstar, Mich.

FOR SALE—Delicious raspberry-basswood-milkweed honey by parcel post or express, nicely crated. 5-lb. pail, $1.25; 10-lb., $2.40, and 60-lb. can, $12.00, f. o. b. here. Honey is liquid and put up with same care as bottled goods. Write for prices of pails in quantity lots or granulated honey in 60-lb. cans. Sample, 10c.
P. W. Sowinski, Bellaire, Mich.

HONEY AND WAX WANTED.

BEESWAX WANTED—For manufacture into SUPERIOR FOUNDATION. (Weed Process.)
Superior Honey Co., Ogden, Utah.

WANTED—Beeswax, also old combs and cappings to render on shares.
F. J. Rettig, Wabash, Ind.

BEESWAX wanted. Old combs (dry) and cappings for rendering. Also wax accepted in trade. Top market prices offered.
A. I. Root Co. of Iowa, Council Bluffs, Iowa.

WANTED—Shipments of old combs and cappings for rendering. We pay the highest cash and trade prices, charging but 5c a pound for wax rendered. The Fred W. Muth Co., Pearl and Walnut Sts., Cincinnati, O.

OLD COMBS WANTED—Our steam wax-presses will get every ounce of beeswax out of old combs, cappings, or slumgum. Send for our terms and our new 1921 catalog. We will buy your share of the wax for cash or will work it into foundation for you. Dadant & Sons, Hamilton, Illinois.

WANTED—Well-ripened white-clover extracted honey. Mention how packed and quote price, f. o. b. Mahwah. John VandenBerg, Mahwah, N. J.

WANTED—Beeswax. We are paying 1 and 2c extra for choice yellow beeswax, and in exchange for supplies we can offer a still better price. Be sure your shipment bears your name and address, so we can identify it immediately upon arrival, and make prompt remittance.
The A. I. Root Co., Medina, Ohio.

FOR SALE.

HONEY LABEL—New designs. Catalog free.
Eastern Label Co., Clintonville, Conn.

FOR SALE—A full line of Root's goods at Root's prices. A. L. Healy, Mayaguez, Porto Rico.

ROOT'S goods at Root prices. A. W. Yates, 3 Chapman St., Hartford, Conn.

FOR SALE—10-frame hive bodies in flat.
C. H. Hodgkin, Rochester, Ohio.

FOR SALE—Novice extractor, practically new.
A. V. Lott, Sellersburg, Ind.

FOR SALE—SUPERIOR FOUNDATION, "Best by Test." Let us prove it. Order now.
Superior Honey Co., Ogden, Utah.

ROOT'S BEE SUPPLIES—For the Central Southwest Beekeeper. Beeswax wanted. Free catalog. Stiles Bee Supply Co., Stillwater, Okla.

FOR SALE—Comb foundation which satisfies the most particular beekeeper. Wax worked at lowest rates. E. S. Robinson, Mayville, N. Y.

PUSH-IN-THE-COMB CAGES—Quickest and safest way to introduce queens, 50c postpaid.
F. R. Davis, 203 Oak St., Weehawken, N. J.

HOFFMAN frames and cypress reversible bottom-boards, new, in flat. Money-saving prices.
Elton Warner, Asheville, N. C.

HOW many queens have you lost introducing? Try the safe way, push-in-comb introducing cage, 50c postpaid. O. S. Rexford, Winsted, Conn.

BEES WANTED—50 to 200 colonies free from disease. Conrad Weber, Liverpool, R. D. No. 1, N. Y.

FOR SALE—1400 new shallow frame supers, wired and full sheets, mostly drawn combs.
R. B. Fletcher, Bliss, Idaho.

FOR SALE—New and used beehives and supers, 250-egg incubator. Farm of 140 acres.
R. Hibbard, Calcium, N. Y.

FOR SALE—Full line of new and second-hand Jumbo and Langstroth bee supplies at modest prices. Send for complete list.
The Hofman Apiaries, Janesville, Minn.

FOR SALE—Good second-hand empty 60-lb. honey cans, two cans to the case, at 60c per case f. o. b. Cincinnati. Terms, cash with order. C. H. W. Weber & Co., 2146 Central Ave., Cincinnati, Ohio.

THE DOMESTIC BEEKEEPER, under new ownership, now reaches every interest, contains exceptionally good articles, timely information, all the news worth printing. Monthly, $1.50 per year. Sample copy for the asking.
The Domestic Beekeeper, Lansing, Mich.

FOR SALE—500 pounds of Dadant's light brood foundation for Hoffman frames, put up in boxes holding 50 pounds net. This foundation is in the best of shape, the same as I received it. I will not accept orders for less than one box. Price, 75c per pound. M. E. Eggers, Eau Claire, Wisc.

PORTER BEE ESCAPES save honey, time, and money. Great labor-savers. For sale by all dealers in bee supplies.
R. E. & E. C. Porter, Lewiston, Ills.

FOR SALE or on shares, 14 apiaries, one or all. Healthful location with American school and church in town, on stone road. Last crop over 40 tons. M. C. Engle, Herradura, Cuba.

FOR SALE—Good second-hand double-deck comb-honey shipping cases for 4¼ x 4¼ x 1⅞ sections, 25c per case, f. o. b., Cincinnati. C. H. W. Weber & Co., 2146 Central Ave., Cincinnati, Ohio.

FOR SALE—Danzenbaker fences, section holders and end support boards for 50 10-frame supers. In good condition, no disease, $30.00 for the lot, or fences alone, $18.00.
A. C. Faulkner, Basking Ridge, N. J.

BEEKEEPERS' SUPPLIES—We manufacture hives, brood frames, etc., and sell a full line of beekeepers' supplies. Everything guaranteed to fit, and anything not satisfactory may be returned. Prices are the lowest. Send a list of your wants. We save you money. M. E. Ballard, Roxbury, N. Y.

FOR SALE—Owner wants use of one of our outside warehouses, so we must move this stock. Slightly dusty and shop-worn, 1-story 8-frame hives, packages of five, $15.00; also a new 10-frame, $17.50. Offer good only as long as this stock lasts.
A. G. Woodman Co., Grand Rapids, Mich.

FOR SALE—One Root-Hatch wax press, single screw, good condition, $12.50; one 60-gal. galvanized honey storage tank, $14.00; new, white pine, standard dovetailed ten-frame hive bodies, with metal rabbets, nailed but not painted, in lots of ten or more, $1.25 each.
J. B. Hollopeter, Queen-breeder, Rockton, Pa.

FOR SALE—Bargain price! All good as new. 4,000 Hoffman frames, slightly used, $5.00 per 100; 1 Doolittle solar wax press, $8.00; 10 reversible bottom-boards, 10-frame, 50c each; 1 Root improved wax press and uncapping can, $20.00; 20 4 x 5 x 1⅜ plain section supers, 75c each empty. Or $200.00 takes the lot. For immediate delivery. Edwin G. Baldwin, Ashtabula, Ohio.

AUTOMOBILE REPAIRS

AUTOMOBILE owners should subscribe for the AUTOMOBILE DEALER AND REPAIRER; 150-page illustrated monthly devoted exclusively to the care and repair of the car. The only magazine in the world devoted to the practical side of motoring. The "Trouble Department" contains five pages of numbered questions each month from car owners and repairmen which are answered by experts on gasoline engine repairs. $1.50 per year. 15 cents per copy. Postals not answered. Charles D. Sherman, 107 Highland Court, Hartford, Conn.

MISCELLANEOUS

SEE our large advertisement on page 187. N. O. Fuller, Medina, O.

FOR SALE—Good two-story house with big garden and 50 colonies bees. Bargain.
John Martin, Bell Center, Wisc.

S. C. Light Brown Leghorn Cockerels, the best show and laying strain, $3.00 and up; also baby chicks. H. M. Moyer, Boyertown, R. D. No. 3, Pa.

FOR SALE—Carneaux pigeons, 50 pairs red and yellow, fine birds, $2.00 a pair.
W. E. Genthner, Saugerties, N. Y.

FOR SALE—Unhulled, white blossom, biennial sweet-clover seed, $3.50 per bushel, f. o. b. Macon, Miss. Geo. A. Hummer & Sons, Prairie Point, Miss.

STRAWBERRY PLANTS—Improved Senator Dunlap, best of all strawberries. Prices on application. McAdams Seed Co., Columbus Grove, Ohio.

MY supply of annual sweet clover seed is almost exhausted. Only 5 pounds left. S. Rouse, Ludlow, R. D. No. 2, Ky.

FOR SALE—New metal-spaced frames. Send 5c for sample frame and new low price, also new 10-frame hive bodies. Wm. Craig, Aitkin, Minn.

FOR SALE—Yellow biennial sweet clover seed, hulled, 17c a lb., unhulled, $4.00 a bu. Send postage for small orders. F. Rasmussen, Rockville, Nebr.

FOR SALE—23 acres with wood, lumber, apple trees, buildings, engine and wood-sawing outfit, 16 colonies bees. Apply to owner,
E. B. Whipple, Hillsboro, N. H.

FOR SALE—A. E. F. photos. A wonderful collection of 20 French Life Scenes for $1.00. Catalog and sample for 10c.
Homer R. Rowell, Groveland, Mass.

FOR SALE—Tomato seed, yellow, with large bright pink centers. Ornament to any table. Very productive. 10, 15, and 25c pkts.
L. G. Knauf, Seaman, Ohio.

MAPLE SYRUP—I am now booking orders for pure maple syrup to be delivered in April. Order early. Satisfaction guaranteed.
G. E. Williams, Somerset, R. D. No. 4, Pa.

I WILL gladly send to my customers postage money for the return of my two-pound bee cages, sent them with bees the last two seasons. I need them. They are worth $1.00 apiece to me. Please notify me how many you have.
Jasper Knight, Hayneville, Ala.

NITRAPO—15 per cent nitrogen, 15 per cent potash, all available. Best fertilizer known for fruit and truck crops. 100 lbs. equals ton mixed fertilizer. Write for descriptive circular and prices on Nitrapo and nitrate of soda.
S. H. Burton, Gen. Sales Agent, Washington, Ind.

WANTS AND EXCHANGES.

WANTED—Several colonies of bees.
R. J. Whitney, R. D. No. 6, Royal Oak, Mich.

WANTED—A second-hand extractor.
E. L. Garrow, E. Magnolia St., Lakeland, Fla.

WANTED—Several hives of bees or nuclei. Henry Roorda, 10729 LaFayette Ave., Chicago, Ills.

WANTED—Several bee-outfits (preferably near home). H. G. Quirin, Bellevue. Ohio.

WANTED—A good honey location and bee outfit. Delbert Lhommedieu, Colo, Iowa.

WANTED—20 10-frame queen-excluders, 7 wire and wood. J. A. Richard, Grelton, Ohio.

WANTED—Good power four-frame automatic extractor. Fred Day, Alcester, S. D.

WANTED—Second-hand queen-excluders, wood or metal. Karl J. Lohman, Cameron, Mo.

WANTED—To correspond with some person acquainted with beekeeping in the state of Tamaulipas, Mexico. I. C. Bachtel, Lake City, Calif.

WANTED—200 or less colonies of bees for spring delivery. Any style hive or box. Remembering 10c honey is in sight for 1921.
A. W. Smith, Birmingham, Mich.

WANTED—Bees on Hoffman frames free from disease. Write stating number of colonies and price, to J. W. B., care The A. I. Root Co., Inc., 23 Leonard St., New York City.

WANTED—Disease-free bees, beehives, supers, tops, and bottoms. What have you?
Lloyd W. Smith, Madison, N. J.

WANTED—50 second-hand 10-frame Standard hive bodies. A. F. Roorda, 10741 Lafayette Ave., Chicago, Ills.

WANTED—To quote special prices on queen cages in quantity lots, to breeders. State quantity wanted. A. G. Woodman Co., Grand Rapids, Mich.

WANTED—Old combs and cappings for rendering on shares. Our steam equipment secures all the wax. Superior Honey Co., Ogden, Utah.

WANTED—50 comb-honey supers, complete, for 4¼ x 4¼ sections, f. o. b. here.
G. W. Osterhouse, Picaho, Idaho.

WANTED—Second-hand 10-frame comb-honey supers, 4 x 5 plain sections preferred. Must be good and clean and within 400 miles of Sioux City.
M. G. Beals, Oto, Iowa.

WANTED—To exchange 4-horse E. B. right-hand, 2-gang riding plow, almost new, only used one season. Having bought a tractor and 3-gang plow is reason for wanting to exchange for bee supplies, and nuclei with queens. What have you?
J. C. Provins, Spartansburg, Pa.

BEES AND QUEENS.

FINEST Italian queens. Send for booklet and price list. Jay Smith, R. D. No. 3, Vincennes, Ind.

FOR SALE—Italian queens and nuclei.
B. F. Kindig, E. Lansing, Mich.

HARDY Italian queens, $1.00 each.
W. G. Lauver, Middletown, Pa.

WHEN it's GOLDEN, it's PHELPS.
C. W. Phelps & Son, Binghamton, N. Y.

GOLDEN Italian queens, untested, $1.50 each; dozen, $14.00. E. A. Simmons, Greenville, Ala.

FOR SALE—1921 Golden Italian queens, price list free. Write E. E. Lawrence, Doniphan, Mo.

FOR SALE—Bright Italian queens, $1.50 each; $14.00 per doz. Ready after April 15.
T. J. Talley, Greenville, R. D. No. 3, Ala.

NOTICE—We have booked orders for all the bees we will sell this season.
Jones & Stevenson, Akers, La.

FOR SALE—Golden queens ready May 1; 1, $1.50; 6, $7.50; 12, $14.00; 100, $100. Virgins, 75c each. W. W. Talley, Greenville, R. D. No. 4, Ala.

FOR SALE—12 colonies in 10-frame Standard hives. Wintered in winter cases, pure-bred Italian queen, 1920. Emil Uyldert, New Brunswick, N. J.

FOR SALE—1 or 50 colonies of bees in 10-frame Hoffman hives, inspected, $20.00 each, April and May delivery. S. K. Blundin, Oxford Valley, Pa.

FOR SALE—14 colonies; 2-frame reversible extractor; 24 extra bodies and 45 supers for comb honey. Price, $175. George Olson, Hematite, Mo.

PACKAGE BEES and PURE ITALIAN QUEENS. Booking orders now for spring delivery. Circular free.
J. E. Wing, 155 Schiele Ave., San Jose, Calif.

FOR SALE—450 hives of bees; 800 comb-honey supers filled with sections; 600 empty comb-honey supers; 600 extracting hives with combs; 200 hives of full sheets; 500 empty cans; 700 shipping cases; 4-frame power extractor and other bee supplies, with Dodge commercial car, and store house and four acres. Write for further information.
J. A. Cornelius, Crook, Colo.

FOR SALE—Golden or three-banded virgins, 60c each, or $6.00 per dozen. Safe arrival.
R. O. Cox, Luverne, Ala., R. D. No. 4.

BEES and QUEENS from my Carolina apiaries—progeny of my famous Porto Rican pedigreed-breeding stock. Elton Warner, Asheville, N. C.

FOR SALE—Leather-colored Italian queens, tested, until June 1, $2.50; after, $2.00; untested, $1.25; 12, $13.00. Root's goods at Root's prices.
A. W. Yates, 15 Chapman St., Hartford, Conn.

Business-First queens, untested, $1.50 each; select untested, $1.75; tested, $2.25; select tested, $2.50. Safe delivery guaranteed, orders filled promptly.
M. F. Perry, Bradentown, Fla.

PACKAGE BEES and NUCLEI with ITALIAN QUEENS, for spring delivery. No disease in our yards. Write for prices and terms.
The Allenville Apiaries, Allenville, Ala.

FOR SALE—A. I. Root Co. strain of leather-colored Italians. Virgins only, May to October 1, 75c; 10, $7.00; 100, $65.00.
P. W. Stowell, Otsego, Mich.

BEES BY THE POUND — Also QUEENS. Booking orders now. FREE circulars give details. See larger ad elsewhere. Nueces County Apiaries, Calallen, Texas. E. B. Ault, Prop.

FOR SALE—Queens, Golden or three-banded. Untested only. 1, $1.50; 6, $8.00; 12, $15.00. Orders booked now for June 10 or later.
Ross B. Scott, LaGrange, Ind.

FOR SALE—15 colonies of Italian bees of 10 frames, frames wired and combs built from full sheets of foundation. No disease.
H. Shaffer, 2860 Harrison Ave., Cincinnati, Ohio.

BEES—35 hives of bees in 10-frame hives, Hoffman frames, all foundation drawn comb; also extra hives and supers, with drawn combs located near Kingston, N. Y. Write J. O. Stewart, 742 Elmore Pl., Brooklyn, N. Y.

ORDERS booked now for delivery June 1. 3-frame nuclei and queen, $7.50; select tested, $8.50. Dr. Miller's strain. No pound packages. Low express rates and quick transit to north.
S. G. Crocker, Jr., Roland Park, Baltimore, Md.

1921 price of bees and queens from the A. I. Root Co. leather-colored stock. 1 lb. bees with queen. $5.00; 2 lbs. $7.50. Untested queens, $1.50 each: dozen, $15.00. Safe arrival. Orders booked now.
Greenville Bee Co., Greenville, Ala.

WE believe we have the best Italian queens obtainable. Our new system is working wonders. Book your order now for 1921. Untested, $1.50; tested, $3.00; virgins, imported mothers, 50c.
F. M. Russell, Roxbury, Ohio.

WE are now booking orders for early spring delivery of two and three frame nuclei, with untested or tested queens. Write for prices and terms. We also manufacture cypress hives and frames.
Sarasota Bee Co., Sarasota, Fla.

FOR SALE—100 colonies bees, 10-frame hives, first class absolutely. These can be shipped north April 15 and made into two colonies by June. No better investment can be made, $12.00 each.
Joe C. Weaver, Cochrane, Ala.

ITALIAN QUEENS OF WINDERMERE are superior three-banded stock. Untested, $1.50 each; 6 for $8.00; tested, $2.50 each; select tested, $3.00. Bees by the pound. Write for prices.
Prof. W. A. Matheny, Ohio University, Athens, O.

FOR SALE—Italian bees by the colony, free from foul brood, 8, 9, and 10 frame hives (Hoffman frames), strong colonies, $15.00; good, $13.50, and medium, $12.00, delivered on board cars at Dayton, Pa., in good order. Cash with order. Inquire of Jacob Long, Sr., Dayton, R. D. No. 1, Pa.

BOOK your orders now for our three-banded and Golden Italian queens; untested, $1.25 each; 6, $6.50; 12, $12.50. G. H. Merrill, Pickens, S. C.

IF good three-banded Italian queens are wanted, send your order to M. Bates & Sons, Greenville, Ala., R. D. No. 4. One queen, $1.15; 100, $100. Pure mating, safe arrival, and satisfaction guaranteed.

DAY-OLD ITALIAN QUEENS—High quality, low price, satisfied customers. Safe arrival guaranteed in U. S. and Canada. Safe introduction. Prices: 1, 75c; 12, $7.20; 100, $60. Write for circular early.
James McKee, Riverside, Calif.

WILL ship by April 30 about 50 3-frame nuclei, or 50 3-lb. packages with untested queens, at $7.50 each in lots of 5 or more. 20 per cent deposit. Lots of experience at shipping end, as well as receiving end.
A. J. Heard, Kirkwood, Ga.

FOR SALE—30 colonies of bees in 10-frame hives, spaced 9 frames to the hive, shipment to be made about June 1 after they are unpacked. Also write for prices on what you may want in bee supplies.
F. J. Rettig, Wabash, Ind.

FOR SALE—2-lb. packages Italian bees and queens by parcel post, postage paid, delivery April 15, for $8.50; 2-frame nuclei with Italian queen by express, not prepaid, delivery May 5, $9.00.
Otto J. Spahn, Pleasantville, N. Y.

FOR SALE—Three-band Italian bees and queens, ready June 1. Fine stock, free from disease and guaranteed to please you. (One grade) select untested queens, $1.50 each; 6, $8.00; 12, $15.00; 50, $60.00. Nuclei, $3.00 per frame, Hoffman; bees, $3.00 per pound. A. E. Crandall, Berlin, Conn.

FOR SALE—100 to 500 colonies bees, and also our home if desired. This is a chance to purchase a business located in some of the finest buckwheat territory within New York State. Come and look this proposition over. Full details given by letter.
Fred D. Lamkin, Poplar Ridge, N. Y.

FOR SALE—Root's strain of golden and leather-colored Italian queens, bees by the pound and nuclei. Untested, $1.50 each; select untested, $2.00; tested, $2.50 each; select tested, $3.00. For larger lots write. Circular free.
A. J. Pinard, 440 N. 6th St., San Jose, Calif.

SHE-SUITS-ME queens, season of 1921. Untested Italians, $2.00 each, 10 or more, $1.75 each, from May 15 to June 15. After June 15, $1.50 each, up to nine queens, 10 to 24 queens, $1.40 each, 25 and up, $1.25 each.
Allen Latham, Norwichtown, Conn.

FOR SALE—Three-banded leather-colored and Golden Italian bees. These are great honey-producers. Gentle, hardy, resistant against bee diseases. Two, three and four lb. packages, with one comb of brood to each package. Safe delivery, no disease. With or without queens.
M. Voinche, Bunkie, La.

FOR SALE—Honey-Brook Farm can supply you promptly, beginning April 10, with the very best three-banded Italian queens, one grade, select untested, $1.50 each or $15 per dozen; tested, $2.00 each straight, ready April 1. Should you find some queenless colonies this spring, send me your order for a young queen to save them. I will not disappoint you. I have the bees and can deliver the goods. Pure mating, safe arrival, and satisfaction guaranteed.
Jasper Knight, Hayneville, Ala.

IF you think PHELPS GOLDEN QUEENS are BEAUTIFUL, GENTLE, and just what you want to IMPROVE YOUR STOCK, we will do our best to supply you if you do not rush us quite as hard as you did last year, but will give us time to fill your order in its turn. Mated (untested), $2.00 each; virgins, $1.00 each; tested, from $4.00 to $5.00 each; select breeders, $10.00 each. We will commence sending queens just as early as weather will permit us to rear good ones. C. W. Phelps & Son, 3 Wilcox St., Binghamton, N. Y.

BEES BY THE POUND, also pure-bred QUEENS; booking orders now for delivery after March 15th. Everything guaranteed. Brazos Valley Apiaries, Gause, Texas.

FOR SALE—Pure Italian queens and nuclei, 1 untested queen, $1.50; 12, $15.00; tested queens, $2.50 each; 2-frame nucleus, $5.00; 3-frame nucleus, $6.50. Add price of queen wanted to price of nucleus.
Frank Bornhoffer, R. D. No. 17, Mt. Washington, O.

WE are now booking orders for 3-lb. packages for May delivery, 3-lb. package with untested queen, $7.00; 3-lb. package with tested queen, $8.00. Orders booked as received. Safe delivery, satisfaction and no disease guaranteed. All bees shipped on a comb of brood and honey. 50 per cent down will book your order. J. L. St. Romain, White Clover Farm & Apiary, Hamburg, La.

FOR SALE—Pure Italian queens, Golden or leather-colored, packages and nuclei; 1 untested queen, $1.50; 6, $7.50; 12, $13.50; 50, $55.00; 100, $100; virgins, 50c each; packages 24 and under, $2.25 per pound; 25 and over, $2.00 per pound; nuclei, 1-frame, $4.00; 2-frame, $6.00; 3-frame, $7.50; queens extra. One-story 10-frame colony with queens, $12.00. Golden Star Apiaries, R. 3, Box 166, Chico, Calif.

FOR SALE—100 12-frame hives; 175 extracting supers, 1000 drawn combs; 500 wired frames; 300 empty frames; 70 queen-excluders; 75 metal top corners; 20 wood top corners; 40 inner covers; 25 wintering boxes for two hives each. The frames are not as large as the standard. The hives are about the same capacity as the standard 10-frame hive. Located near Scottville, Mason County, Mich.
L. D. Allen, Myakka City, Fla.

FOR SALE—Five hives of Italian bees, one 8-frame double, four single, all Langstroth. All went into winter quarters strong, plenty of honey, and are packed in one large case on east side of building. Four queens are one year old, one queen two years. Five queen-excluders and 12 shallow supers go with bees. Bees were inspected two years ago and have no disease. $40.00 for the lot.
M. A. Bartlett, 508 Lincoln Ave., N. W. Canton, O.

QUEENS, three-banded Italians only. Now that the booking season for nuclei has passed, and, while I have a large number of orders for nuclei, I shall not be too busy with these to fill your orders for queens. 1 untested for April, $1.25; 12, $12.50; 1 untested for May 1 to June 1, $1.00; 12, $10.00. I ship no queens after June 1; weather is too hot. Discount on large orders. Safe arrival guaranteed.
L. R. Dockery, Carrizo Springs, Texas.

FOR SALE—Three-banded and Golden queens, also package bees. No disease and safe arrival guaranteed. Queens any time after March 15. Untested, $1.75 each; 25 or more, $1.50 each; tested, $3.00 each; breeders, $10.00 each. As our honey flow is practically over by May we will begin shipping package bees about May 15. 1-lb. package, $3.00; 2-lb. package, $5.00. We will not book any orders that we cannot fill. Dr. White Bee Co., Sandia, Texas.

FOR SALE—1921 prices on nuclei and queens, 1-frame nucleus, $3.00; 2-frame nucleus, $5.00; 3-frame nucleus, $6.50, without queens, f. o. b. Macon, Miss. 5 per cent discount in lots of 25 or more. Untested queens, $1.50 each; $15.00 per dozen; tested, $2.00 each; $22.00 per dozen. No disease. Inspection certificate with each shipment. Safe arrivals and satisfaction guaranteed in U. S. Queens sold only with nuclei.
Geo. A. Hummer & Sons., Prairie Point, Miss.

FOR SALE—2-lb. package bees without queens, $4.50; 3-lb. same as above, $5.75; 5-lb swarm, $8.00. Queens, each $1.50. Select tested queens for breeders, $2.50 each. A few hybrid bees from outyards, but remember all queens are reared from our home-yard. We are now booking orders for May deliveries, 20 per cent cash with order, balance 10 days before shipping. Safe delivery guaranteed, also free from disease of any kind. Oscar Mayeux, Lock Box No. 15, Hamburg, La.

FOR SALE—Three-band leather-colored Italian bees and queens, two-pound packages only. Shipping season from April 15 to May 20. Safe arrival and satisfaction guaranteed. No disease. Order early if you wish prompt delivery. Write for price list.
J. M. Cutts, Montgomery, R. D. No. 1, Ala.

VIGOROUS leather-colored Italian queens, famous three-banded stock; untested, $2; tested, $3; in lots of 25 or 50, $1.50 each. Bees in packages, two pounds, $6; three pounds, $7; 10 three-pound packages, $7.50 each, including queens. Nuclei, two-frame, $6; three-frame, $7; queens extra; in lots of ten, each with queen, $7.50. Good, strong colonies in 10-frame standard hives, $18 each. I believe my queens can not be surpassed; I breed from select stock. Terms, cash with order for these reduced prices. References furnished if required. Shipments begin during latter part of April.
C. M. Elfer, St. Rose, La.

PRITCHARD QUEENS (Three-banded Italians)—My first season selling direct to the trade. June price: 1 untested, $1.75; 6 for $9.50; 1 select untested, $2.00; 6 for $11.00. After July 1: 1 untested, $1.50; 6 for $8.00; 1 select untested, $1.75; 6 for $9.50. Write for prices on larger quantities. I have a few extra-select tested queens one-year old at $5.00 each. Queens clipped free of charge on request. Acknowledgment and directions for introducing sent on receipt of order. Safe delivery and satisfaction guaranteed. Let me book your order now for early delivery, specifying the date of shipment desired. Otherwise orders will be filled in rotation. Arlie Pritchard, Medina, Ohio.

FOR SALE AT A BARGAIN—A fine bee outfit and 30 acres of good land. 40 colonies bees in A1 condition in one of the best wintering cellars in Michigan. A fine honey-house over cellar. Queens are all young, 8 and 10 frame hives, square-edge Hoffman frames, all nice, straight combs; also a No. 1 outfit for several hundred colonies. No. 1 wax-rendering outfit, steam heat from a No. 1 high-pressure boiler, large capping tank, also Peterson melter and outfit, oil stove and tanks, lumber, comb, foundation, etc. Apiary is nicely protected from cold winds by natural-growth timber and bushes. This is one of the very best locations in Michigan for honey. Oceans of both alsike and white clover, basswood, sumac, and considerable raspberry, with plenty of spring and fall bloom. Outfit also includes hundreds of supers of good extracting combs, and supers ready for foundation, all in good condition. The small number of colonies of bees is due to my having sold most of them last spring. Price, $1400, one-half cash, balance to suit. Reason for selling—old ages and inability to work. Must make some change soon. O. H. Townsend, Lake City, Mich.

HELP WANTED.

WANTED—A live young man to help me during season of 1921. Allen Latham, Norwichtown, Conn.

WANTED—Both experienced and inexperienced help, board furnished. State experience and wages in first letter. Stover Apiaries, Mayhew, Miss.

WANTED—Young man of good habits, to work with bees, some experience necessary. Room and board furnished. State all particulars in first letter.
B. B. Coggshall, Groton, N. Y.

WANTED—Experienced beeman, married man preferred. State in first letter experience and ability, age, nationality, and wages wanted.
W. J. Stahmann, Clint, Texas.

WANTED—Man with some experience to work with bees coming season. State age, experience, and wages, based on our furnishing board. The Rocky Mountain Bee Co., Box 1319, Billings, Mont.

WANTED—Married man to work with bees and poultry, house and garden furnished. State experience had, age, weight, and height. Also wages expected. Reference required. Also one single man wanted. E. L. Lane, Trumansburg, N. Y.

WANTED for the season of 1921 an experienced queen-breeder. State experience had, reference, age, height, weight.
W. J. Forehand & Sons, Ft. Deposit, Ala.

WANTED—Active and reliable young man for coming season, begin about April 1. Will give benefit of my experience and some wages. State weight, height, age and beekeeping experience, if any, also wages expected. Have several apiaries and modern equipment. David Running, Filion, Mich.

WANTED—One experienced man, and students or helpers, in our large bee business; good chance to learn. Modern equipment and outfit, including auto truck; located near summer resorts. Write, giving age, height, weight, experience, reference, and wages wanted. W. A. Latshaw Co., Clarion, Mich.

WANTED—A willing and reliable, clean young man to assist with bees in outyards. Will give you my experience and wages. State experience you have had, age, weight, height, and wages expected. Board and lodging furnished. Start work about March 1
A. L. Coggshall, Groton, N. Y.

WANTED—Married man to work with bees and poultry. House and garden furnished. State experience had, age, weight, and height; also wages expected. Reference required. Also one single man wanted. G. G. Cimbring, 901 Cemetery St., Williamsport, Pa.

HELP WANTED—Will give experience and fair wages to active young man not afraid of work, for help in large, well-equipped set of apiaries for season, starting in April. State present occupation, weight, height, age, and beekeeping experience, if any. Morley Pettit, The Pettit Apiaries, Georgetown, Ont.

WANTED—Two young men, able-bodied, willing to work, clean in body and mind, who want to learn beekeeping and are willing to exchange faithful services for instruction from a man with almost 40 years of extensive experience in beekeeping, board and some financial remuneration. Have 12 apiaries. R. F. Holtermann, Brantford, Ont., Can.

WANTED—One experienced man and students, clean habits, able-bodied and willing workers, as helpers with our more than 1000 colonies. Opportunity to learn the business from A to Z, 1920 crop 122,000 pounds. Theory also. Write immediately, giving age, height, weight, habits, former employment, experience, references, wages, photo, all in first letter. E. F. Atwater (former Special Field Agent in Beekeeping, U. S. Dept. Agr.), Meridian, Idaho.

SITUATIONS WANTED

SITUATION WANTED by experienced beekeeper. Shares or salary. Good references. State proposition in first letter. N. B. Armstrong, 406 Center St., Ithaca, N. Y.

TWO high school seniors want work in modern apiary during vacation, June 14 to Sept. 7. Well-read. Backlot experience.
L. F. Horn, 3209 Greenwood Ave., Louisville, Ky.

WANTED—Young man, 19, wants position in modern apiary, after finishing senior year in High School; good deal of experience with bees. Report early in June. N. C. or Tenn. preferred.
Wellons Dunn, Paces, Va.

WANTED—Work on poultry farm, or in apiary west of Rocky Mts., until beginning of next high school term, by boy 18 years of age. Employer must furnish references. Dwight Glassey, Albany, R. D. No. 2, Ore.

WANTED—Swedish young man, 27, wants work with some extensive apiarist as helper to gain experience in extracted-honey production, or queen and package business. Go anywhere. Some experience. H. N., care Miss V. Nordenswan, 26 Breed St., Lynn, Mass.

POSITION WANTED—Work in first-class apiary under experienced beeman. Worked parts two seasons. Want to work with bees. Better experienced in extracting. Can drive Ford. Good nailing up and wiring. Box 943, Buhl, Idaho.

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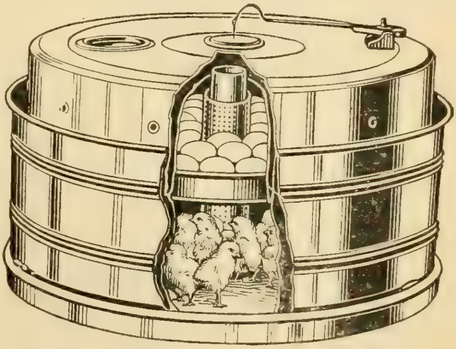

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Early delivery, order now.
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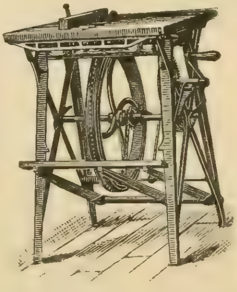

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LARGE, HARDY, PROLIFIC QUEENS

Three-band Italians and Goldens, pure mating and safe arrival guaranteed. We ship only queens that are top-notchers in size, prolificness, and color. Untested, $2.00 each; six for $11.00; twenty-five for $45.00. Tested queens, $3.00 each, six for $16.00.

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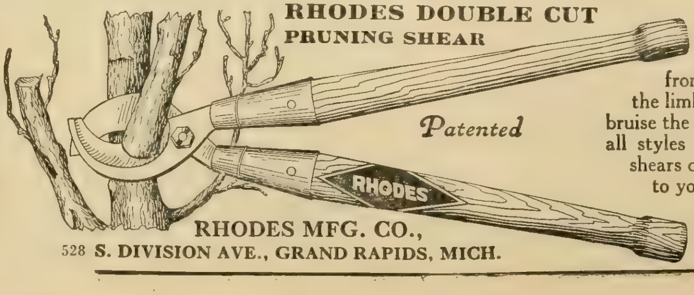


THE only pruner made that cuts from both sides of the limb and does not bruise the bark. Made in all styles and sizes. All shears delivered free to your door.

Write for circular and prices.

RHODES MFG. CO.,
528 **S. DIVISION AVE., GRAND RAPIDS, MICH.**

FOR SALE

Three-banded Italian Bees and Queens after April 15th.

	1	12
Untested Queens	$1.75	$15.00
Select Untested Queens	2.25	20.00
Tested Queens	2.75	28.00
Select Tested Queens	3.25	33.00

Breeders $5.00 to $10.00 at all times.
A limited amount of one and two frame Nuclei. Prices on request.

H. L. MURRY
SOSO, MISS.

Buy Your Bee Supplies Now

Take advantage of early-order discounts by ordering NOW. We guarantee to please you. "Prompt service and the very best" is our motto. *We want your beeswax and old comb.* Highest cash and trade prices offered. Texas beekeepers should write A. M. HUNT, Goldthwaite, Texas.

Manufactured by
Leahy Manufacturing Company
95 Sixth St., Higginsville, Missouri.
Write for FREE catalog. It is to your interest.

Extracted Honey We Sell It! Write for Prices
C. C. Clemons Produce Co.
132 Grand Avenue
KANSAS CITY, MISSOURI

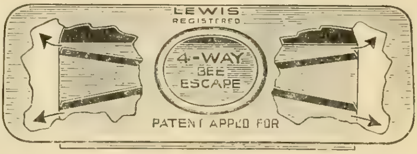
KELLOGG'S
FREE BOOK
1921 EDITION
GREAT CROPS OF
STRAWBERRIES
AND HOW TO GROW THEM.
Full of reliable strawberry information. Pictures and describes the world's leading strawberries, Kellogg's Big Four, New Race and Everbearers. Tells how others are making big cash profits from
Kellogg Strawberry Gardens
If you want to economize and also make a substantial cash profit right at home, plant a Kellogg Garden this spring. Our FREE BOOK tells all about them and what they are doing in other homes. Send for your FREE copy today. (1)
R. M. KELLOGG COMPANY
Box 301 Three Rivers, Michigan
STRAWBERRIES

Established 1885.
Write us for catalog.
ALWAYS ON TOP
BEEKEEPERS' SUPPLIES
The Kind You Want and the Kind That Bees Need.

We have a good assortment in stock of bee supplies that are mostly needed in every apiary. The A. I. Root Co.'s brand. Let us hear from you; information given to all inquiries. Beeswax wanted for supplies or cash.

John Nebel & Son Supply Co.
High Hill, Montgomery Co., Mo.

LEWIS 4-WAY BEE ESCAPES



Four exits from supers. Fits all standard boards. Springs of coppered steel. Made of substantial metal. Made by
G. B. Lewis Company, Watertown, Wis., U.S.A.
Sold only by Lewis "Beeware" Distributors.

INDIANOLA APIARY

will furnish 3-banded Italian bees and queens: Untested queens, $1.00 each; tested, $1.50 each. One pound bees, no queen, $2.00. No disease.

J.W.SHERMAN,VALDOSTA,GA.

Queens

Write for our catalog of high-grade Italian Queens. Pure mating and safe arrival guaranteed.

Prices for 1921.

1 to 4 inclusive	$3.00 ea.
5 to 9 inclusive	2.90 ea.
10 or more...	2.80 ea.
Breeders	12.00 ea.

Jay Smith
Route Three
Vincennes, Indiana.

PATENTS Practice in Patent Office and Court
Patent Counsel of The A. I. Root Co.
Chas. J. Williamson, McLachlan Building,
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World's Best Roofing at Factory Prices

"Reo" Cluster Metal Shingles, V-Crimp, Corrugated, Standing Seam, Painted or Galvanized Roofings, Sidings, Wallboard, Paints, etc., direct to you at Rock-Bottom Factory Prices. Positively greatest offer ever made.

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cost less; outlast three ordinary roofs. No painting or repairs. Guaranteed rot, fire, rust, lightning proof.

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Get our wonderfully low prices and free samples. We sell direct to you and save you all in-between dealer's profits. Ask for Book No. 183

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Lowest prices on Ready-Made Fire-Proof Steel Garages. Set up any place. Send postal for Garage Book, showing styles.

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FREE SAMPLES **Wonderful Value Wholesale Prices Highest Quality**

Don't fail to investigate these bargains. Recleaned Tested Timothy **$3.95** bu. Sweet Clover unhulled, **$4.50** bu. Alsike Clover & Timothy **$5.85** bu. Sudan Grass **8**1-2c lb. Prices cover some grades of limited quantities. Clover and other Grass & Field Seeds at low prices. All sold subject to State or Government Test under an absolute **money-back guarantee.** We specialize in grass and field seeds. Located to save you money and give quick service. We expect higher prices-Buy now and save big money, Send today for our money-saving Seed Guide, explains all-**free.**

American Mutual Seed Co. Dept. 651 **Chicago, Ill**

Condon's NEW PROSPERITY CABBAGE

Quick as lightning. Hard as stone. One of the earliest in existence. To introduce our **Northern Grown "Sure Crop" Live Seeds** we will mail you 200 **seeds** of **Condon's New Prosperity Cabbage and our Big 1921 GARDEN and FARM GUIDE . . . . FREE**

Send Postal Today for your free copy and Trial Package

CONDON BROS., SEEDSMEN,
Rock River Valley Seed Farm
Box 116 ROCKFORD, ILLINOIS

Pure Italian Queens, Nuclei, Full Colonies

Orders booked now for delivery spring and summer 1921. Untested, 1 to 12 inclusive, $1.50 each; over 12, $1.25 each. Select Untested, 1 to 12 inclusive, $1.75; over 12 $,1.50 each. Tested, 1 to 12, inclusive, $2.50; over 12, $2.25 each. Select Tested, suitable for breeders, $5.00 each.

Two-frame nuclei, $5.00 each; add price of queen wanted.

Eight-frame colony, $15.00; ten-frame colony, $17.50. Tested queen in all of these, and all good combs.

Health certificate with each shipment. Safe delivery in United States guaranteed. Satisfaction everywhere.

Twenty-five per cent books your order, balance at time of shipment.

Jensen's Apiaries

CRAWFORD, MISS.
R. F. D. No. 3.

NEW ENGLAND

BEEKEEPERS will find a complete stock of up-to-date supplies here. Remember we are in the shipping center of New England. If you do not have a 1921 catalog send for one at once.

H. H. Jepson, 182 Friend St., Boston 14, Mass.

MASON BEE SUPPLY COMPANY
MECHANIC FALLS, MAINE
From 1897 to 1921 the Northeastern
Branch of The A. I. Root Company

Prompt and Efficient Service

BECAUSE—Only Root's Goods are sold.
It is a business with us—not a side line.
Eight mails daily.
Two lines of railway,

If you have not received 1921 catalog send name at once.

BANKING BY MAIL AT 4%

The corner letter box, the smallest cross-road post-office, or rural free delivery carrier becomes a receiving teller for your money, affording safe delivery of the deposits and the return of a formal acknowledgment from the bank.

You can safely send your deposits to this bank by mail.

THE SAVINGS DEPOSIT BANK CO.
A. T. SPITZER, Pres.
E. R. ROOT, Vice Pres. E. B. SPITZER, Cash.
MEDINA, OHIO

Did You Receive Our Catalog?

We handle a full line of beekeepers' supplies, honey cans, and foundation. We are Texas headquarters for Lewis Beeware, Bingham Smokers, Muth Veils, Dadant Foundation, and

Aluminum Honey-Combs.

This very important addition to beekeeping equipment is being manufactured here in Texas by a company composed wholly of beekeepers.

Advantages

Positive prevention of loss from melting in hot weather — this comb is constructed of aluminum (not wax), therefore it entirely eliminates loss of bees and honey through melting and sagging of combs in hot weather.

Extraction of heavy honey easily accomplished with this comb; this is practically impossible with wax combs. Breakage of combs in extracting is eliminated.

This comb permits entire control of the production of drone-bees.

This comb will last a lifetime; you can use it over and over again.

Uses

The combs furnish quick storage space in the supers. They should be first used as extracting combs. The cells are perfect worker-cells a quarter of an inch deep. The bees extend the cells with wax to full depth. They are then easily uncapped and after being once extracted may be used as brood combs.

Queen-cells are drawn on this comb as readily as on wax combs. The uncapping knife does not mash the cell walls if common care is used.

Should you neglect your aluminum combs the moths may eat the wax extension, but will not harm the metal.

Bees have been successfully wintered on these combs in climates as varied as that of Texas and Nevada.

Price List

Standard Langstroth (Hoffman brood frame) size, each	60c
Shallow Extracting (5⅜ in. deep) size, each	50c
Modified Dadant (Jumbo depth) size, each	70c

Prices are f. o. b. San Antonio, Texas.

Parcel Post Weight, 1 comb....	2 lbs.
Parcel Post weight, 10 combs..	11 lbs.
Parcel Post weight, 20 combs..	20 lbs.

The Editors of Gleanings in Bee Culture, altho not indorsing aluminum combs, will thoroughly test these combs made in Texas, and will announce their conclusions as to the merits of them, in their climate and latitude, upon the completion of their tests in several apiaries.

Write for our new catalog containing full description and prices on Lewis Beeware, Dadant Foundation, Aluminum Honey Combs.

TEXAS HONEY PRODUCERS' ASSOCIATION

1105 S. Flores St. P. O. Box 1048. San Antonio, Texas

E. G. LE STOURGEON, Manager.

Quality Bee Supplies From a Reliable House

¶ Without fear or favor I place my BEE SUPPLIES and SERVICE before you.

¶ It is the small annoyances that often grow into disastrous results. Avoid the so-called ''little losses'' by using MONDENG'S goods. Quality is first—save time when you put your goods together by getting supplies that are accurately made. Service is next—no delays when bee supplies are ordered from my factory.

¶ I am ready to meet your urgent needs. Send for my latest price-list.

¶ Closing out all Langstroth and Wisconsin hives and supers. Also Langstroth triangular top-bar frames, and eight-frame D. T. supers for 4 x 5 sections. At cost price, write for quotations.

Charles Mondeng

146 Newton Ave. N. &
159 Cedar Lake Road.
MINNEAPOLIS, MINNESOTA.

Beeswax Wanted

In big and small shipments, to keep Buck's Weed-process foundation factory going. We have greatly increased the capacity of our plant. We are paying higher prices than ever for wax. We work wax for cash or on shares.

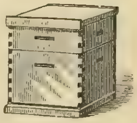
Root Bee Supplies

Big stock, wholesale and retail. Big catalog free.

Carl F. Buck

The Comb-foundation Specialist
August, Kansas
Established 1899.

BEE SUPPLIES



We are prepared to give you value for your money. Our factory is well equipped with the best machinery to manufacture the very best bee supplies that money can buy. Only the choicest material suitable for beehives is used. Our workmanship is the very best. Get our prices and save money.

EGGERS BEE SUPPLY MFG. COMPANY, INC.

Eau Claire, Wis.

EVERY SHEET THE SAME

As alike as peas in a pod—only more so. That is a distinguishing feature of my comb foundation. Accuracy is my watchword. My foundation is not left with the natural milled edge, but every edge is trimmed with an absolutely straight, smooth cut, and always measures right to the dot, no matter what the size ordered.

This accurate trimming not only expedites placing the foundation in the frames, but also permits of such close packing for shipment that there is no chance for it to chuck around, thus jamming the edges.

Although this extra trimming adds to the cost of manufacture, still my prices are lower than others.

Your own wax worked into foundation at lowest rates. Send for complete price list.

E. S. Robinson

Mayville, Chautauqua Co., N. Y.

QUEENS AND BEES

Mr. Beekeeper, if you want good quality, quick service, prompt attention, and perfect satisfaction, TRY NORMAN BROS. pure three-banded Italians, queens and bees, and see for yourself. We are not going to say that we have the best in U. S. A., but we do say that we have as good as can be bought for the money. Our bees are hardy, gentle, prolific, disease-resisting, and honey-gatherers. Orders booked for one-fourth cash; balance before shipment is desired.

Prices for April, May, and June.	1	6	12	100
Untested	$1.50	$8.00	$15.00	$100.00
Select Untested	1.75	9.25	16.50	115.00
Tested	2.75	13.75	24.50	
Select Tested	3.50 each			

BEES—We ship only 2-lb. pkgs. by express $5.00 each; 25 or more, $4.75 each f. o. b. shipping point. Add prices of queens wanted. We guarantee pure mating, safe arrival, and freedom from all diseases. Remember you take no risk when you deal with us. Isn't that enough said? Reference: Bank of Ramer, Ramer, Ala.

THE NORMAN BROS. APIARIES - - NAFTEL, ALABAMA

FOREHAND'S QUEENS---THEY SATISFY, WHY?

Because of 28 years of experimental work, with both queen-breeding and honey-production. With breeding and selecting of imported queens, I have reached a standard which is ideal. Queens as good, but none BETTER. Why experiment? Take advantage of the life experience of my breeders. OUR SERVICE STATION.—We are ready to serve you at all times, whether you desire queens or advice. Let us help you with your bee problems. All questions are cheerfully answered.

I breed three-banded Italians only. Nov. 1st to June 1st.

	1	6	12
Untested	$2.00	$9.00	$16.00
Selected Untested	2.25	10.50	18.00
Tested	3.00	16.50	30.00
Selected Tested	3.50	19.50	36.00

Orders booked now for spring delivery. One-fourth the full amount with order and balance when shipment is desired. Pure mating, safe arrival, and perfect satisfaction guaranteed. Write for circular and large-order discounts. Foreign orders at receiver's risk.

N. FOREHAND - - - - RAMER, ALABAMA

THE OLD RELIABLE
THREE-BANDED ITALIANS

Booking orders now for 1921. Queens ready April 1st. My Italians are of an exceptionally vigorous and long-lived stock strain of bees. They are gentle, prolific, very resistant to foul brood, and the best of honey-gatherers. I have sold a good many queens to parties who are using them in stamping out foul brood. Orders booked for one-fourth cash, balance before delivery. Will guarantee safe arrival in the United States and Canada. Descriptive circular and price list free.

	Prices April, May, and June			July to November		
	1	6	12	1	6	12
Untested	$1.50	$8.00	$15.00	$1.25	$6.50	$12.50
Select Untested	1.75	9.00	16.00	1.50	8.00	15.00
Tested	2.50	12.50	24.00	2.25	12.00	22.00
Select Tested	3.00 each			3.00 each		

No nuclei or pound packages of bees for sale.

John G. Miller, 723 C St., Corpus Christi, Tex.

HONEY-BROOK FARM

TWO & THREE LB. PACKAGES ITALIAN BEES —ALSO THREE-BANDED ITALIAN QUEENS—Delivered to you by parcel post. My bees are untiring workers—gentle, prolific, properly priced. Pure mating absolutely guaranteed. Ready for shipping April 10. To be in line let me book your order now. Only ten per cent cash required with order, balance just before you desire shipment. No package bees sent without a queen.

Prices: Two-pound packages, including untested queen, $6.50. Three-pound package, including untested queen, $9.00. Twelve or more packages, 25c per package less. Queens: Untested, $1.50 each, or $15 per dozen. Tested, $2.00 each straight. I will pay all postage on package bees and queens. Empty cages to remain my property and to be returned at my expense. Prompt service, safe arrival and satisfaction guaranteed.

JASPER KNIGHT, PROP. HAYNEVILLE, ALA.

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FARM WAGONS

High or low wheels—steel or wood—wide or narrow tires. Steel or wood wheels to fit any running gear. Wagon parts of all kinds. Write today for free catalog illustrated in colors.

ELECTRIC WHEEL CO., 23 Elm Street, Quincy, Ill.

Southern Headquarters for Package Bees and Reliable Queens

Three-Banded Italians Only

PRICE OF BEES: 1-lb. package, $3.50; 2 lbs., $5.50; 3 lbs., $7.50, Add price of grade of queen wanted to these prices. Write for descriptive price list.

PRICE OF QUEENS: Untested, $1.50 each; six, $8.50; twelve, $16.00; fifty or more, $1.25 each. Select untested, $1.75 each; six, $9.50; twelve, $18.50; fifty or more, $1.50 each. Tested Queens, $3.00 each.

Prompt service, safe arrival of queens, and satisfaction we guarantee. Any of our untested queens that prove to be mismated will be replaced free of charge. No foul brood or other contagious bee disease has ever been in our vicinity.

W. D. ACHORD - - - FITZPATRICK, ALABAMA

Early Spring----Buy NOW!

INDICATIONS point to an early spring. You'll want bee supplies on hand when the season starts.

Order now! Deliveries can then be made in plenty of time. For 40 years "Falcon" bees and supplies have been giving satisfaction. Let them help you make this year the biggest and best ever.

Write for our red catalog.

W. T. FALCONER MFG. CO.

FALCONER (near Jamestown) N. Y., U. S. A.

Where the best beehives come from.

Honey Producers, Take Notice

Do you realize it is only a short time until your bees will be taken out of winter quarters? Have you thought about supplies for next season? Do not wait until swarming time for that means dollars out of your pocket. Order your supplies NOW.

We manufacture and carry in stock a complete line of Bee Supplies ready for prompt shipment. Send us a list of the supplies you wish to purchase and we will be pleased to quote you our prices. Our 1921 descriptive catalog and price list is now ready for mailing. Send us your name and address and we will mail it to you.

August Lotz Company, Boyd, Wisconsin

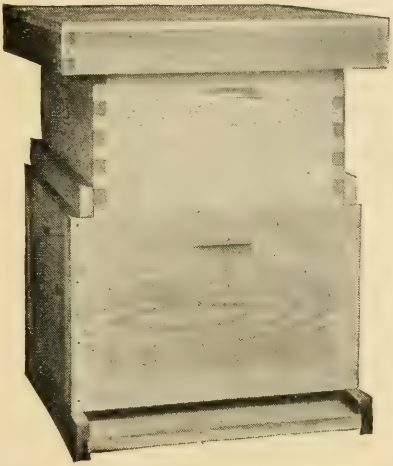
Modified Dadant Hive

Your present brood equipment can be put above the Modified Dadant hive used as full depth supers.

Features are: Deep frames, large one-story brood nest, frame space ventilation, excellence in wintering, swarming easily controlled.

Glance at this illustration to compare this hive with "Standard" Langstroth hive.

You can get 40 per cent greater brood-comb area than in the "Standard" ten-frame Langstroth.



Modified Dadant Hive Features.

1. Eleven frames, Langstroth length, Quinby depth.

2. Frames spaced 1½ inches for swarm control.

3. Extracting frames 6¼ inches deep.

4. Dovetailed body, regular reversible bottom and metal roof cover with inner cover.

5. Langstroth "Standard" equipment easily used with this hive.

For free booklet write any distributor of Lewis "Beeware," or to

G. B. Lewis Company - - - - - - Watertown, Wisconsin
Dadant & Sons - - - - - - - - - - Hamilton, Illinois

Those delicious vegetables

and glorious flowers that you admired last summer—do you realize that many were grown from Storrs & Harrison seeds?

Perhaps you have thought of us only as nurserymen, knowing that we do the largest nursery business in the country. Our nursery trade was built up by holding the friendship of planters who know they may depend absolutely that any variety we offer has outstanding merit, and

S & H SEEDS DESERVE YOUR CONFIDENCE JUST AS FULLY AS THE SPLENDID TREES, SHRUBS, PERENNIALS AND ORNAMENTALS THAT WE HAVE BEEN PRODUCING THESE LAST 67 YEARS.

Our catalog is a worthy helper for the professional grower and the amateur who appreciate the better varieties.

The Storrs & Harrison Co.

Nurserymen and Seedsmen

BOX 94. PAINESVILLE, OHIO.

Completely Destroys the Weed Growth

More than that, the BARKER breaks the hardest crust into a level, porous, moisture-retaining mulch—**all in the same operation.**

A ten-year-old boy can run it—do more and better work than ten men with hoes. Saves time and labor, the two big expense items.

BARKER WEEDER, MULCHER AND CULTIVATOR

Eight reel blades revolve against a stationary underground knife — like a lawn mower. **Best Weed Killer Ever Used."** Works right up to plants. Cuts runners. Aerates the soil. Has leaf guards, and shovels for deeper cultivation—3 *garden tools in* 1.

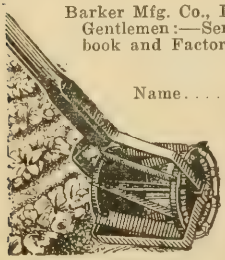
FREE ILLUSTRATED BOOK.

Tells how gardeners and fruit-growers everywhere are reducing their work; increasing their yields.—How to bring growing plants through a dry season.—How to conserve the moisture and force a larger, more rapid growth. Send TODAY for this free, illustrated book and special Factory-to-User offer.

BARKER MANUFACTURING COMPANY

Dept. 23. David City, Neb.

Barker Mfg. Co., Dept. 23, David City, Neb.
Gentlemen:—Send me postpaid your free book and Factory-to-User offer.



Name........................

Town ....

State ....

R. F. D. or Box........

Two Thousand Nuclei For Spring Delivery

A great many progressive beekeepers of today buy nuclei to make up winter losses, or in the form of pound packages to strengthen weak colonies. We know this is a good investment, and for a good many years have raised bees in the South, sending them north to catch the honey flow in July and August. It is our policy, in furnishing our customers with bees from our southern apiaries, to furnish bees that give satisfaction to you, as they have to us for the past ten years. We are very particular as to the strain of bees we keep, and the rearing of our queens is in the hands of an expert.

We maintain that the queen is the life of the colony, and they are reared under the most favorable conditions, that of natural swarming, and they are fine large ones with energy to spare, and as good as money can buy. However, we do not sell queens, but we see that a good queen goes with every nucleus we sell. We guarantee you safety against disease, as our bees are inspected constantly, and our apiaries closely watched to see that no disease appears. Our prices as follows:

	April	May	June
1-frame nucleus	$4.00	$3.50	$3.00
2-frame nucleus	5.50	5.00	4.50
3-frame nucleus	7.00	6.50	6.00
4-frame nucleus	9.00	8.50	8.00

Full colonies of bees, $12.00 per colony

1-pound package	$2.50
2-pound package	4.50
3-pound package	6.50

For packages with queens add $1.50 for each package.

WEBER BROS. HONEY CO.

RIALTO, CALIFORNIA

Our Food Page—Continued from page 156.

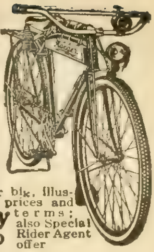
JUST at this point a letter arrived from Axel Holst, St. Thomas, Virgin Islands, which is so in line with what I have written that I am going to quote briefly from it.

Mr. Holst says: "If Fat Soluble vitamine, the growth essential, in honey is due to pollen, then it would be fair to conclude that where pollen is being used as a food that growth would ensue. In the Beekeepers' Guide (1910) page 126, Prof. Cook states, 'As the microscope shows, undigested pollen is given to the drone larvae after the fourth day, which is not true of either queen or worker.' The drone undoubtedly becomes the largest of them all.

"The said vitamine might also be found in the wax itself, but even so be due to the pollen in the honey consumed in order to make the wax. The newer the comb, the greater the contents of vitamine would most likely be — also one reason why it could be found in comb honey but not in extracted.

"That the presence of pollen is of great importance in the production of wax and influencing the ease with which wax is being produced, I believe is well known; and the abundance of pollen in spring time may be the reason for the apparent ease with which wax is being produced at that time."

The above needs no comment, but I would like to add that R. Adams Dutcher in 1918 proved that corn pollen is relatively rich in the Water Soluble B vitamine, but I do not know of any investigations with reference to the Fat Soluble vitamine. As pollen is a food for the young of bees, it seems reasonable to suppose that it would contain the latter-named vitamine as well as the former.



Delivered to you Free for 30 days trial on approval. Your choice of **44 Styles,** colors and sizes of famous **Ranger** Bicycles. **Factory-to-Rider** lets you buy at wholesale prices, *express* prepaid, direct from maker.

12 Months to Pay lets you enjoy your **Ranger** at once. Many boys and girls easily save the small monthly payments. The **Ranger** is a better bicycle than you can buy anywhere at any price.

Tires lamps, horns, wheels, parts and equipment at half usual prices.

SEND NO MONEY. Simply write for our big, illustrated free **Ranger** catalog with lowest prices and terms; also Special Rider Agent offer

Mead Cycle Company Dept G 153 Chicago

VICK'S GARDEN & FLORAL GUIDE for 1921

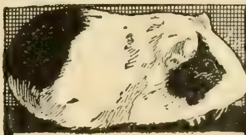
IT'S FREE **A WORTH WHILE BOOK** *WRITE TODAY*

For vegetable growers and all lovers of flowers. Lists the old stand-bys; tells of many new varieties. Valuable instructions on planting and care. Get the benefit of the experience of the oldest catalog seed house and largest growers of Asters in America. For 72 years the leading authority on vegetable, flower and farm seeds, plants, bulbs, and fruits. 12 greenhouses. 500 acres.

Vick Quality Seeds Grow the Best Crops the Earth Produces

This book, the best we have issued, is *absolutely free. Send for your copy today before you forget. A postcard is sufficient.*

JAMES VICK'S SONS, 33 Stone St.
Rochester, N.Y. *The Flower City*



Raise Guinea PIGS- FOR US!

We need men and women, boys and girls everywhere to raise Guinea Pigs for us. We tell you where to get them, show you how and buy all you raise. Big opportunity for money making. Thousands needed weekly.

Easy to Raise—Big Demand No special knowledge, **Large Profits** experience or equipment needed. They breed the year round — are very prolific — require but little space or attention. Pay better than poultry or squabs—cost less to house, feed, keep, easier raised — less trouble, market guaranteed. **FREE** Particulars, contract, and booklet how to raise

CAVIES DISTRIBUTING COMPANY
3145 Grand Avenue, Kansas City, Mo.
Largest Guinea Pig breeders and distributors in America.

"For Lovers of Art Needle Work"
The Wonder Embroidery Needle

It is easy to embroider the AUTOBROIDER WAY. So simple a Child Can Operate It.

THIS WONDERFUL NEW INVENTION enables you to do the most beautiful hand embroidery in very short time, and so easily that no skill is needed.

Makes all stitches alike and is self-feeding. You can embroider Dresses, Scarfs, Pillow Tops, Center Pieces, Children's Clothes, in fact, everything that should be embroidered.

Ten times as fast and at half the cost of the old way. You can also make beautiful velvet-effect rugs. The most "HUMAN NEEDLE" ever produced to be worked by hand.

Price of Needle complete with instructions, skein of yarn, pillow top and back for $1.50 prepaid.

Send Money Order, Check, or Currency in place of stamps when possible.

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Western Union
A. B. C. Fifth Edition

PATON & COWELL
217 Broadway, New York
COMMISSION MERCHANTS

Wholesale Dealers in all Varieties of
PURE HONEY
IMPORTED AND DOMESTIC

If you have Honey for sale, send us samples and your asking prices. If you want to buy Honey, write or wire us for prices and samples.

REFERENCES: THE AMERICAN EXCHANGE NATIONAL BANK, New York, or your own Bank.

* * *

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217 BROADWAY
NEW YORK

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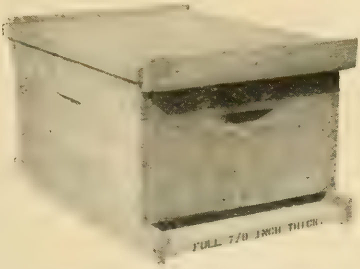


Priced under favorable manufacturing conditions.

Cypress Bee Supplies

On account of being in the cypress belt and having extremely low operating expenses we are able to offer you the supplies made of the finest soft cypress obtainable, which is almost as soft and light as white pine.

Hives are standard dimensions, dovetailed, hand holds on all four sides, supplied with rabbets, nails, and Hoffman frames. Prices include cover, bottom, body, and frames.

A full line of Root's supplies and Airco Foundation kept in stock. Let us quote you on your 1921 requirements in either Root's or our goods.

8-frame 1-story hives complete in lots of 5	$14.75
10-frame 1-story hives complete in lots of 5	16.00

Above supplied with Root-Hoffman frames at $1.50 extra for 5 8-frame, and $1.85 for 5 10-frame.

Hive Bodies.

Eight-frame	$0.95 each
Ten-frame	1.05 each

Bottom-boards are made of ⅞-inch lumber throughout. Floor is tongued and grooved together, reversible, of standard dimensions and construction. Price:

8-frame in lots of 5	$0.75
10-frame in lots of 5	.80

Prices of Bees.

Untested queens: 1, $2.00; 12 or more, 1.50 each. Tested queens, $3.00.

1-lb. package without queen	$4.00
2-lb. package without queen	6.75
2-frame nuclei	7.00
8-frame colony	20.00
10-frame colony	22.00

1 carload bees in 8-frame cypress hives for shipment in spring from Helena, Ga., at $12.50 each.

Covers.

All covers are flat and reversible. Both one and two piece are the same in every respect, except the one-piece is made from wide clear boards and the two-piece is joined with metal. Cypress covers do not warp.

8-frame two-piece	$0.70
10-frame two-piece	.75
8-frame one-piece	.85
10-frame one-piece	1.00

Absolutely the best cover made.

Fresh stock foundation shipped from factory direct to you at wholesale prices in lots of 50 pounds or more.

SEND FOR CATALOGUE.

The Stover Apiaries

Helena, Ga. **Mayhew, Miss.**

March is here, and we begin to see visions of our bees flying here and there. Are we going to have our supplies ready for the busy little workers? They will do their part in bringing in the honey if we do ours.

Don't leave it too late before ordering. Now is the time. Send us your order now, and we will ship at once. Have you veils, smokers, hive-tools, and other appliances on hand?

B READY FOR THE B's

F. A. SALISBURY

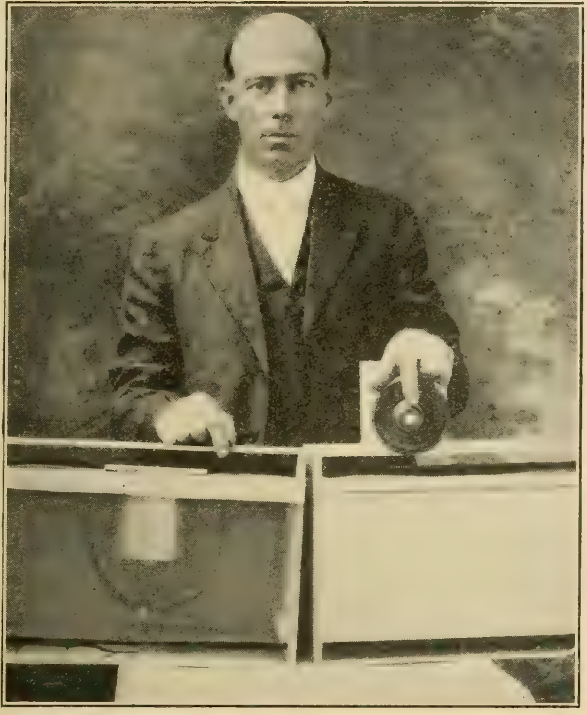
1631 W. Genesee Street
SYRACUSE, NEW YORK

New York State Beekeepers,
Send for our catalog.

The prophets tell us we are to have an early Spring. This means you will want your supplies on hand. Swarming time will soon be here. Take our advice. Order now.

Why delay, and regret it? Send in your order; then put your hands in your pockets and say to your neighbor, "Well, I'm prepared, are you?"

THE AULT 1921 BEE SHIPPING CAGE



Patent Pending

1st. It is a dark cage, much more so than the open screen cages we have been shipping in in the past.

2nd. The feeder uses pure sugar syrup. Better than Honey or Candy to ship on; it contains water as well as feed.

3rd. Feeders are made more substantial, 1-3 larger, and have screw cap that will not jar out.

4th. Instead of one small hole, we now use a cotton duck washer in the screw cap that has proven to overcome all the objections found to the liquid feed method.

5th. The Cage is one piece screen wire protected by thin boards on the outside. Send for free circular describing the cage in detail, prices, etc.

Queens—Package Bees—Queens

Will book your order with 20 per cent down, balance just before shipping. My Free Circular gives prices in detail, etc. Safe delivery Guaranteed within 6 days of shipping point. We ship thousands of pounds all over U. S. A. and Canada.

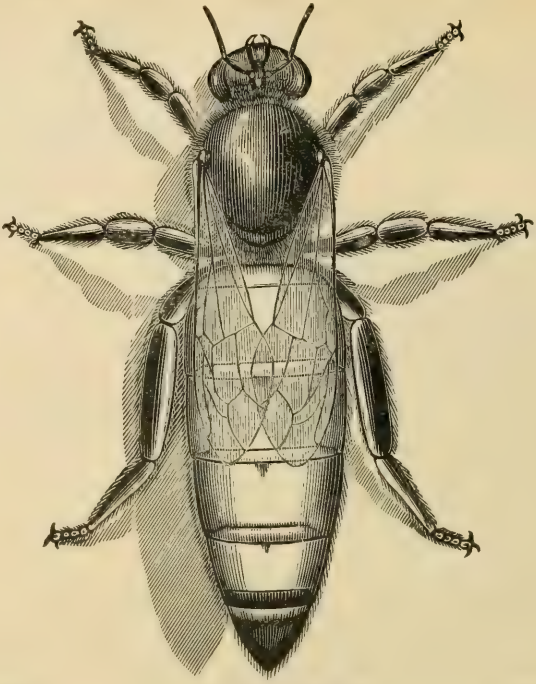
1-pound package bees, $3.00 each, 25 or more $2.85 each.
2-pound package bees, $5.00 each, 25 or more $4.75 each.
3-pound package bees, $7.00 each, 25 or more $6.65 each.
F. O. B. Shipping Point. Add price of queen wanted.

1 Untested Queen, $2.00 each; 25 or more, $1.75 each
1 Select Unt. Queen, $2.25 each; 25 or more, $2.00 each
1 Tested Queen, $3.00 each; 25 or more, $2.70 each
1 Select Tested, $3.50 each; 25 or more, $3.00 each

Nueces County Apiaries

E. B. AULT, Prop. --::-- **Calallen, Texas**

My first peep out on the dawn of a new year.



Highest Quality **Prompt Service** **Satisfaction**

The Reliable Three-Banded Italian Queens

We are now booking orders for 1921. Queens will be ready after May 15th, one-fourth down, balance just before shipping date. Place your orders early, as we fill orders in rotation.

WHY ORDER FARMER QUEENS?

They are bred by as skillful and experienced queen-breeders as can be found in the United States. There are very few places where queens are reared under as favorable conditions as in our queen-rearing yards. We devote our time to rearing as good queens as possibly can be, and we positively guarantee that no better can be reared; we spare neither labor nor money in developing our strain of Italians. It is our intention to improve our original stock each year and to be more skillful queen-breeders. Our first original stock was procured from the highest quality obtainable, which we have proved to the highest point and is now not surpassed by any. Our own eyes inspect every queen that leaves our yards; no culls sent out. Place your orders, and after you have given our queens a fair test and you are not satisfied in every way that they are as good as any you have ever used, just return them and we will send you queens to take their places or return your money. They are very resistant to diseases, the very best for honey-gathering. You take no risk in buying our queens; safe arrival in U. S. A. and Canada; satisfaction is left entirely to purchaser; prompt service given to all orders; every queen guaranteed to be purely mated.

Our Prices:	1	6	12	100
Untested	$1.50	$ 8.00	$15.00	$100.00
Select Untested	1.75	9.50	17.00	120.00
Tested	3.00	14.75	25.00	
Select Tested	4.00	23.00	42.00	

Write for prices on larger quantities than 100.

The Farmer Apiaries - - Ramer, Alabama

Where the good queens come from.

Airco

Foundation

Use it this year.
We want YOU to be the judge.

The A. I. Root Company

Medina, Ohio

For your convenience, prompt service and saving on carriers' charges you can address The A. I. Root Co., at any of the following points where Airco Foundation is always in stock:

Chicago, 224 W. Huron St.
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Council Bluffs, Iowa.
San Antonio, P. O. Box 765.
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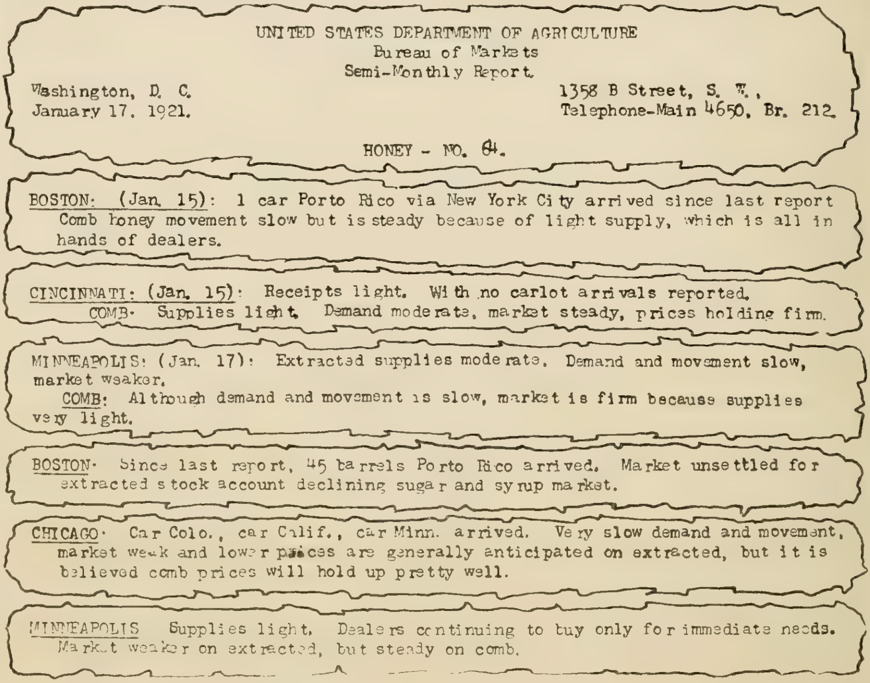
San Francisco, 52-54 Main St.
New Orleans, 224 Poydras St.
New York, 23 Leonard St.
Philadelphia, 8-10 Vine St.
Norfolk, 10 Commerce St.
Syracuse, 1631 W. Genessee St.

Agencies all over the country.

Uncle Sam on Comb Honey



UNITED STATES DEPARTMENT OF AGRICULTURE
Bureau of Markets
Semi-Monthly Report.

Washington, D. C.
January 17, 1921.

1358 B Street, S. W.,
Telephone-Main 4650, Br. 212.

HONEY - NO. 64.

BOSTON: (Jan. 15): 1 car Porto Rico via New York City arrived since last report Comb honey movement slow but is steady because of light supply, which is all in hands of dealers.

CINCINNATI: (Jan. 15): Receipts light. With no carlot arrivals reported. COMB: Supplies light. Demand moderate, market steady, prices holding firm.

MINNEAPOLIS: (Jan. 17): Extracted supplies moderate. Demand and movement slow, market weaker.
COMB: Although demand and movement is slow, market is firm because supplies very light.

BOSTON: Since last report, 45 barrels Porto Rico arrived. Market unsettled for extracted stock account declining sugar and syrup market.

CHICAGO: Car Colo., car Calif., car Minn. arrived. Very slow demand and movement, market weak and lower prices are generally anticipated on extracted, but it is believed comb prices will hold up pretty well.

MINNEAPOLIS Supplies light. Dealers continuing to buy only for immediate needs. Market weaker on extracted, but steady on comb.

This proves comb honey is your best bet. Get first grade prices with Lewis Sections. See a 1921 "Beeware" Catalog. Write today. Ask us for your distributer's name. It's free.

LOOK FOR

BEE HIVES AND APIARIAN EQUIPMENT
BEWARE
WHERE YOU BUY YOUR
BEEWARE
WATERTOWN WIS. U S A
MAKES THE FINEST.
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Branches: Albany, N. Y., Memphis, Tenn., Lawyers (Near Lynchburg), Va.

Massachusetts
APR 4 - 1921
Agricultural
College

Gleanings in Bee Culture

Well Protected from Chilly April Winds

VOL. XLIX April, 1921 NUMBER 4

QUALITY TIN CANS FIRST

For PACKERS and MANUFACTURERS of FOOD PRODUCTS

LARGE CAPACITY
LONG EXPERIENCE

YOUR INQUIRIES SOLICITED

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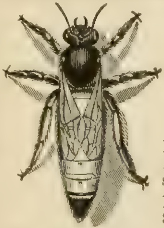
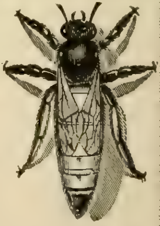
BALTIMORE, MD.

You all know the value of good Queens. When buying why not buy the **BEST**. Our Queen-rearing Apiary, in charge of Henry Perkins, will be able to supply the "Best" Queens obtainable shortly after April 1st.

Send in your order at once to avoid delay in securing your requirements. Prices very attractive. Satisfaction guaranteed.

MILLER BOX MANUFACTURING CO.
201 North Avenue 18
Los Angeles, Cal.

Southern Headquarters for Package Bees and Reliable Queens

Three-Banded Italians Only

PRICE OF BEES: 1-lb. package, $3.50; 2 lbs., $5.50; 3 lbs., $7.50. Add price of grade of queen wanted to these prices. Write for descriptive price list.

PRICE OF QUEENS: Untested, $1.50 each; six, $8.50; twelve, $16.00; fifty or more, $1.25 each. Select untested, $1.75 each; six, $9.50; twelve, $18.50; fifty or more, $1.50 each. Tested Queens, $3.00 each.

Prompt service, safe arrival of queens, and satisfaction we guarantee. Any of our untested queens that prove to be mismated will be replaced free of charge. No foul brood or other contagious bee disease has ever been in our vicinity.

W. D. ACHORD - - - FITZPATRICK, ALABAMA

ADVANTAGES OF THE NEW BUCKEYE HONEY EXTRACTOR

1. Does not have to be slowed down to reverse.
2. Reversing as many times as desired.
3. Does not break fragile combs.
4. Extracts combs clean—free from all honey.
5. Made strong and substantial.
6. Has been thoroly tested.
7. Made by the oldest and most experienced manufacturers of honey extractors.

Write for quotations. We have just received a shipment of various sizes and styles of extractors.

THE A. I. ROOT COMPANY OF CALIFORNIA

Los Angeles: 1824 E 15th St.
San Francisco: 52-54 Main St.

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Editorial Staff

Geo. S. Demuth and E. R. Root	A. I. Root	Iona Fowls	H. G. Rowe
Editors	Editor Home Dept.	Assistant Editor	M'n'g Editor

Muth's Ideal Bee Veil
$1.50

Order direct from us or any of the G. B. Lewis Co. distributors.

This smiling chap is Jasper Knight, Hayneville, Alabama. There is not a better Queen Breeder in the South than "Jap." Notice he wears a Muth Veil—it's cool even in Alabama.

WE HAVE A COMPLETE STOCK OF Lewis Beeware. Have you taken advantage of our attractive prices on Bee Supplies? Send us a list of your requirements for quotation. Send for catalog.

WE ARE AGAIN IN THE MARKET for shipments of Honey. What have you? Send sample with your best price delivered to Cincinnati.

OLD COMBS AND WAX. DON'T MUSS around rendering old comb; it often spreads bee disease. Send for shipping tabs and bag it up at once. We pay you the market price for wax rendered, less 5c per pound for rendering charges.

BEES.—TWO-FRAME NUCLEI WITH Queen, $8.50. Our Nuclei will make a strong colony by Fall.

QUEENS. — JASPER KNIGHT'S Famous Three-Banded Select Untested Queens, $2.00. For quantity orders write for special prices.

THE FRED W. MUTH CO.
Pearl and Walnut,
Cincinnati, O.

"SUPERIOR" FOUNDATION

Yes, we are ready for the rush. Many tons now ready for shipment, and our machines are running to utmost capacity. Use the best. If your dealer can't supply you, write us for price, stating quantity required. We also accept beeswax for foundation or supplies.

''Everything in Bee Supplies''

SUPERIOR HONEY COMPANY
OGDEN, UTAH.
(Manufacturers of Weed Process Foundation)

Indianapolis Can Give You Some Real Beekeeping Service

We ship your order the same day it is received. Let us give you some of this service. Catalog for the asking. Write for prices on beeswax

THE A. I. ROOT COMPANY
873 Massachusetts Avenue, Indianapolis, Ind.

BEE SUPPLIES

Root's Goods at Factory Prices
With Weber's Service

We carry several carloads of bee supplies, and are able to give prompt shipment at all times. Our motto is a customer must be satisfied; give us a trial and we will show you how quickly we will answer your correspondence; send your order and it will follow 24 hours after we receive it. Our new catalog will be ready about January 15th; send for same. We have thousands of satisfied customers; why not you? Send a list of your wants and we will quote you.

C. H. W. Weber & Co.

2163-65-67 Central Ave., Cincinnati, Ohio.

SUPPLIES

A Superior Quality at Less Cost

We have in New York a complete stock of Apiary Supplies manufactured by THE DIAMOND MATCH CO. They are the largest manufacturers in the world who make Bee Supplies.''

Says a Beekeeper Who Has Used Our Supplies

''Just a few lines to inform you that I am very much pleased to hear that you are going to have a warehouse in New York, as I am certainly pleased with the Hives you make.''

Hoffman & Hauck, Inc., Woodhaven, N. Y.

GET OUR PRICES.

HONEY MARKETS

While good crop prospects, together with a depressed market, may look discouraging as to future prices, beekeepers should remember that sugar may be less plentiful next year. Reports indicate that the acreage of sugar beets, as well as sugar cane, is being greatly reduced.

U. S. Government Market Reports.

SHIPPING POINT INFORMATION, MAR. 15.

LOS ANGELES, CALIFORNIA.—Practically no wire inquiry. Supplies heavy, demand and movement slow, market weak. Few sales being made in 60-lb. cans, carloads f. o. b. usual terms, white orange and white sage 12-13½c, white alfalfa 8-9c, light amber alfalfa 6-6¾c. Hawaiian, white 7½c, light amber 6c. Due to unsettled market conditions, a large proportion of shipments are consigned to eastern markets to be sold by brokers in less than carlots. Bulk honey is moving a little more freely. Practically no export demand is reported. The heavy recent rains are said to insure a large crop this season. Many producers are still holding last year's crop for higher prices than the present market will pay. Monterey County reports most of the old crop sold, with good prospects for the coming year. San Diego County has some 35 cars still in warehouses. A very high percentage of California honey is now disposed of thru co-operative associations. It is reported that contracts for the new crop are being offered for June-July shipment at very low prices. Sacked beeswax of light color is being sold in less than carlots at 33-35c per lb., dark stock being quoted as low as 26c.

INTER-MOUNTAIN REGION (COLORADO AND IDAHO).—Light shipments of both comb and extracted honey reported. F. o. b. price of 7c per lb. for water-white extracted honey is being quoted out for bulk honey in l. c. l. lots, altho some organizations are holding for higher prices. The inquiry is said to be improving somewhat as a result of lower quotations. The selling of extracted honey thru retail stores is a noteworthy movement. Beekeepers are selling water-white grade in ton lots locally at 6½c per lb., and bright yellow beeswax at 32c per lb. Some beekeepers are discouraged over the outlook for 1921, seeing little chance for securing even the cost of production out of prospective prices.

OTHER SECTIONS.—Texas is reported to be moving some light amber extracted honey at 12-14c per lb. in small lots. Considerable stock is being offered, but demand for it is lacking. 25c per lb. is being paid to beekeepers for beeswax. Some new crop honey is already appearing. Wisconsin is said to be holding best extracted clover for 18c per lb.

TELEGRAPHIC REPORTS FROM IMPORTANT MARKETS.

BOSTON.—No arrivals since last report. Comb: Supplies light, little activity but prices holding firm. Sales to retailers, New York, 24-section cases white clover No. 1 heavy $8.50-9.00, light $7.00-8.00; Vermont, 20-section cases white clover heavy $8.50, light $7.50. Extracted: A few scattering sales in small lots reported. Sales to confectioners and bottlers, per lb., California, white sage 19-20c; Porto Rican, no sales reported. Beeswax: Demand and movement very light, no change in prices. Sales to floor wax, shoe polish, and candle manufacturers, per lb., domestic, light 32-35c; African, dark 16-20c.

CHICAGO.—Car Wisconsin, car Colorado, 3,000 lbs. Idaho, 3,000 lbs. California, 1,500 lbs. Michigan arrived. Market very weak, prices gradually declining, trading slow, local buyers doing very little f. o. b. buying and most stock represents consignments. Extracted: per lb., sales to bottlers, Colorado, Idaho, California, white clover and alfalfa 11-12c, light and dark amber 9½-10c. Comb: Sales to retailers, Wisconsin, Michigan, 24-section cases No. 1, heavy $6.50-7.00; dark color, light weight and leaky sections $5.00-6.00. Beeswax, approximately 5,000 lbs. from Oklahoma, Kansas, Missouri and 6,000 lbs. from Central and South America arrived. Market dull, movement slow. Sales to wholesalers, drug houses, electrical houses and harness-makers per lb., Oklahoma, Missouri, and Texas, light 27-32c, dark 26-29c; foreign, best light 25c.

CINCINNATI.—1 car unknown arrived since last report. Supplies liberal. No jobbing sales of honey reported. Beeswax: Supplies liberal, demand and movement moderate, market weaker. Sales to wholesalers, druggists, and dentists, average yellow 32-38c, mostly 35c per lb.

CLEVELAND.—No arrivals since last report. Supplies moderate, practically no movement of bulk honey except in a limited way to bottlers. Dealers quoted: Extracted, western, white sweet clover, 60-lb. cans in 5 to 10 case lots 16-18c per lb., single cases 20-21c.

DENVER.—Market continues quiet, demand and movement light. Sales to jobbers, extracted, per lb., Colorado, white 13-18c, light amber 12½-16c, amber 12c. Comb: Colorado, 24-section cases No. 1 white, $6.10; No. 2, $5.65.

KANSAS CITY.—No carlot arrivals since last report. Supplies liberal, demand and movement slow, market weak on both extracted and comb. Sales to jobbers, extracted: California, light amber alfalfa 10-10½c, extra light amber and white alfalfa 12c. Comb: California, 24-section flat cases No. 1 light alfalfa $6-6.50.

MINNEAPOLIS.—No carlot arrivals. Supplies very light and little prospect of more being bought before the new season. Demand and movement slow, market dull. Extracted: Sales to retailers, bakers and confectioners, western, 60-lb. cans alfalfa and sweet clover mixed light amber 17c. Comb: Sales to retailers, western alfalfa and sweet clover mixed, 24-section cases, very few sales No. 1, $8.00.

NEW YORK.—Light l. c. l. receipts from New York and California. Practically no demand or movement, market dull, very few sales. Bottlers, bakers and confectioners doing little buying, and practically no activity to market. Spot sales to jobbers, wholesalers, confectioners, bakers and bottlers, extracted: Domestic per lb., Californias, light amber and white alfalfa 7-9c, few high as 10c; white orange blossom and white sage 12-15c, few 16c; New York buckwheat 9-10c. Imported, West Indian and South American refined, per lb., 5½-6½c, mostly 6-6½c; per gal. 60-70c, mostly 65-70c. Comb: No supplies, no sales reported. Beeswax: Domestic receipts light, foreign receipts moderate, supplies moderate, demand and movement very slow, market dull, few sales, little buying being done by bleachers and manufacturers. Sales to jobbers, wholesalers, and manufacturers, South American and West Indian, light, best 26-28c, slightly darker 22-25c, dark 17-18c, African, dark 17-19c.

PHILADELPHIA.—No carlot arrivals. Supplies moderate but meeting practically no demand, market very dull. Very few sales in small lots to bakers and manufacturers, extracted: Florida, 60-lb. cans light amber 11c, amber 9c per lb.; Porto Rican, light amber 68c, amber 63c per gallon. Comb and beeswax, no sales.

ST. LOUIS.—Comb: Moderate supplies, movement very slow, market very dull, lack of demand is outstanding feature. Very few sales to retailers in small lots, Colorado, 24-section cases white clover and alfalfa, No. 1 heavy around $8.00. Extracted: Receipts very light but supplies liberal, demand lacking. Few sales to bakers' supply houses, large bakers, and wholesale druggists, in 5-gallon cans, per lb., Missouri, Arkansas and Mississippi, light amber various mixed flavors mostly around 14c, dark amber mostly around 12c. Beeswax: Receipts very light, supplies moderate, very light demand, market dull, few sales reported. Sales to jobbers and candlemakers, Missouri, Arkansas, Mississippi, ungraded average country run mostly around 24c per lb.

GEORGE LIVINGSTON.
Chief of Bureau of Markets.

Opinions of Producers.

Early in March we sent to actual honey-producers, scattered over the country, the following questions:

1. What per cent of the 1920 honey crop is still in the hands of the producers?
2. What is the per cent of winter loss of bees, if any, in your locality?
3. What is the condition of the colonies at present as compared with normal? (Give answer in per cent.)
4. What is the condition of the honey plants at this time as compared with normal? (Give answer in per cent.)

This month, the answers of our regular correspondents (whose initials are given) are tabulated as follows:

	On hand.	Loss....	Col. Con..	Plant Con.
Alabama (J. M. C.)	80	2	135	125
British Columbia (W. J. S.)	0	5	100	100
California (M. H. M.)	?	2	100	75
California (L. L. A.)	50	5	100	75
California (F. B. L.)	50	5	100	75
Colorado (J. A. G.)	35	5	95	100
Florida (W. L.)	10	2	100	100
Idaho (E. F. A.)	75	5	100	100
Illinois (A. L. K.)	10	0	125	50
Indiana (E. S. M.)	33	?	100	75
Iowa (F. C.)	5	0	105	70
Kansas (J. A. N.)	0	5	90	80
Louisiana (E. C. D.)	10	25	100	105
Maryland (S. J. C.)	20	5	125	100
Massachusetts (O. M. S.)	10	?	?	100
Michigan (B. F. K.)	5	0	125	80
Mississippi (R. B. W.)	50	15	85	125
Missouri (J. W. R.)	0	10	75	80
New York (G. H. R.)	12	5	100	100
New York (F. W. L.)	3	0	125	75
New York (A. & M.)	43	0	95	25
Ohio (F. L.)	0	0	100	100
Oklahoma (C. F. S.)	10	0	100	100
Ontario (F. E. M.)	5	?	110	?
Pennsylvania (H. B.)	0	5	90	100
Texas (J. N. M.)	0	3	125	75
Texas (H. B. P.)	1	2	100	90
Texas (T. A. B.)	10	5	80	100
Utah (M. A. G.)	10	5	100	100
Virginia (J. H. M.)	5	3	78	95
Washington (G. W. B. S.)	25	4	110	100
Wisconsin (H. F. W.)	10	5	100	?

Special Foreign Quotations.

LIVERPOOL.—With heavy stocks and no export demand, prices are nominal. Sellers at the moment do not report their sales, which must be quite moderate. The value of extracted honey at today's rate of exchange is 6-7c per pound. The beeswax market is still unsatisfactory. The value in American currency is 25-26c per pound.

Liverpool, England, Mar. 2. Taylor & Co.

CUBA.—The price of honey is 60-70c per gallon; wax, 22c per pound. A. Marzol.

Matanzas, Cuba, Mar. 8.

REPORT OF THE FIRST ANNUAL MEETING OF THE AMERICAN HONEY PRODUCERS' LEAGUE.

FEB. 15-17.

The delegates from the regular beekeepers' associations and from the allied interests gathered in Indianapolis for the first annual meeting of the League. About 50 persons and some 30 organizations were represented. The president, E. G. LeStourgeon of San Antonio, Tex., gave a report of the actions of the officers. H. B. Parks, acting secretary, reported on the activities of the League up to the present time. B. F. Kindig of East Lansing, Mich., chairman of the committee on education, gave a very full report on the work done in apiculture in the various state schools. The bureau of legislation, represented by C. P. Campbell of Grand Rapids, Mich., gave an account of the activities of this bureau in compiling and presenting a brief to the chairman of the Ways and Means committee of congress, asking that a tariff of not less than 48c and not greater than 60c per gallon be placed on honey. A number of minor activities of this bureau were reported, especially one in which there is a case between a beekeeper and a smelter company in Arizona. The League is planning thru its committees to assist in the fighting of this case.

The most interesting occurrence of the meeting occurred on Feb. 16, when Clifford Muth, chairman of the special advertising committee, reported on its activities. Mr. Muth suggested that we pledge the money for the advertising campaign at once. This met with the approval of those present, and, after many spirited speeches and considerable exhorting on the part of F. W. Muth of Cincinnati, the following amounts were subscribed: American Bee Journal, $300; C. H. Weber, $500; G. B. Lewis Co., $400; Texas Honey Prod. Ass'n., $700; F. W. Muth Co., $500; A. I. Root Co., $1000; Wesley Foster, $150; Elyria Enameled Prod. Co., $200; Wisconsin Beekeepers' Ass'n., $200; J. J. Wilder, $50; Georgia Ass'n., $100; Michigan Ass'n., $300; Utah Ass'n., $500; Indiana Ass'n., $100; Texas Ass'n., $100; C. H. Wiley, $50.

The secretary and the advertising committee were instructed to obtain further subscriptions to the advertising fund, and it is very probable that between ten and twelve thousand dollars will be raised. The executive committee was instructed to place a contract with the Proctor and Collier agency for advertising, which will consist of six one-quarter-page ads in Good Housekeeping, these ads to be backed up by articles on honey in the body of the magazine; also, articles in farm and county papers published by three of the newspaper syndicates. In addition to this a recipe booklet is to be prepared for general distribution in answer to the advertisement. The problem of raising additional funds for advertising was thoroly discussed. A. L. Boyden suggested that we ask for two per cent of the value of last year's honey crop, and H. F. Wilson of Wisconsin suggested five cents per colony. It was agreed that those soliciting for advertising, ask that the beekeepers tax themselves either one or the other amount.

The officers were re-elected for 1921, and it was announced that the payment of dues made during 1920 would be applied on the present year. The members present expressed a preference that the next meeting be held at Salt Lake City, Utah, and it is probable that the executive committee will sanction this selection. At the close of the meeting, the executive committee held its annual meeting. It was decided that at the present time no charter is needed, as this would necessitate the holding of the annual meetings at some stated place. A brief estimate indicated that it would require at least $10,000 annually to establish and maintain permanent headquarters for the national secretary. This amount of money can not be raised for this purpose during the present year, but steps were taken towards making arrangements for this important movement.

H. B. Parks was selected as secretary-treasurer of the League for the ensuing year and was required to give a bond in the sum of $10,000. The committee instructed the secretary to solicit contributions to the general expense fund of the League and to issue another number of the League Bulletin as soon as practicable.

The following State associations have already voted to become members of the League: Michigan, Montana, New York, Indiana, Tennessee, Wisconsin, Illinois, Kansas, Kentucky, Iowa, Nebraska, Texas, Utah, and Colorado; also the Chicago Northwestern Beekeepers' Ass'n., Texas Honey Producers' Association, and the California Honey Producers' Association.

Following is the financial report of Chas. B. Justice while acting as secretary: Receipts—Balance N. B. A. acc't., $256.90; received from individuals, $49.50; New York Ass'n., $21.00; Michigan Ass'n., $100; Montana Ass'n., $27; total $454.40. Disbursements—Expressage, $3.31; printing, $11.00; postage, $4.65; telegrams, $10.80; stenog. at K. C., $13.75; photos, $10; wire to Medina, 70c; B. F. K. bill, $7.04; stenog. Lamson, $5; L. S. Gillham Co., $25; LeRoy Carman Printing Co., ("League Bulletin"), $235.25; stenog. services, $50; St. Louis Button Co., $22.70; postage, $5; stationery, $2; total, $406.24; balance on hand, $48.16.

Following is the financial report of treasurer since Buffalo meeting: Receipts—Fred W. Muth Co., $50; Dadant & Sons, $100; American Bee Journal, $100; G. B. Lewis Co., $200; Montana Ass'n., $1; Utah Ass'n., $100; Indiana, $100; Wisconsin, $100; Tennessee, $100; Chicago N. W. Beekeepers' Ass'n., $100; Superior Honey Co., $10; United States Can Co., $10; total $1071. Disbursements—Standard Printing Co., $25.50; postage, $20.80; stenographer, $100; postage, $18.80; stenographer, $100; Standard Printing Co., $230; rubber stamps, 30c; postage, $8.70; stenographer, $100; total, $604.10; balance on hand, general fund, $466.90; receipts Adv. Fund, F. J. Rettig & Sons for Indiana Ass'n., $100.

H. B. PARKS, Secretary.

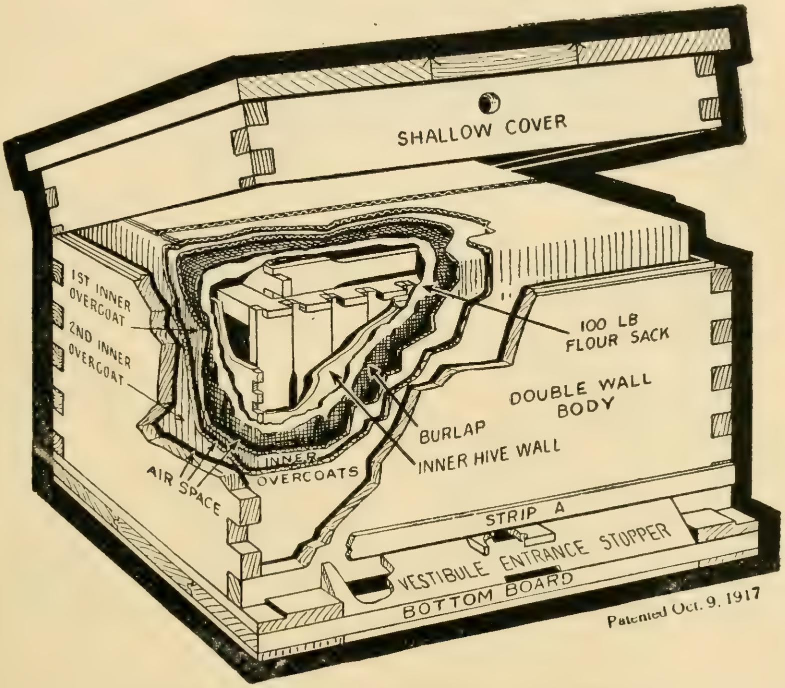
Buckeye Packed Hives
Bee Books
Bee Gloves
Section Honey Boxes
Bee Veils
Honey Extractors
Feeders
Bees
Beginner's Outfits
Gleanings in Bee Culture
Frames
Queen Excluders
Queen Rearing Outfits
Honey Tanks
Standard Dovetailed Hives
Honey Labels
Hive Parts
Smokers
Comb Foundation, Airco Brand
Wax Presses
Capping Melters
Queens

"And they are all Root Quality"

M. H. Hunt & Son
Lansing, Michigan
510 North Cedar Street

Send for 1921 Catalog.

Winter Problem Solved by the Hive With an Inner Overcoat


SHALLOW COVER
1ST INNER OVERCOAT
2ND INNER OVERCOAT
100 LB FLOUR SACK
DOUBLE WALL BODY
BURLAP
INNER HIVE WALL
AIR SPACE
INNER OVERCOATS
STRIP A
VESTIBULE ENTRANCE STOPPER
BOTTOM BOARD
Patented Oct. 9. 1917

Furnished with Jumbo depth or Standard Hoffman Frames.

In your purchase of hives for the coming season, consider the fact that, if well taken care of, they should last a lifetime. A lifetime matter is a serious one, and nothing but the best that money can buy should have your consideration. The Hive with an Inner Overcoat is the best on the market as to material, workmanship, and efficiency. The outside wall is made of ⅞ material, the best for the purpose. Any extra cost over ordinary hives, spread over its lifetime, is very low. The saving in bees, in a single winter, may more than pay for the entire investment. Winter losses in ordinary hives during the winter of 1919-20 in many cases were 75% or more. What a tremendous loss! The Hive with an Inner Overcoat will winter normal colonies, without loss.

Send for a special circular showing large illustrations. New 1921 illustrated catalog of beekeepers' supplies now ready. Send us a list of your requirements for the coming season.

TIN HONEY PACKAGES

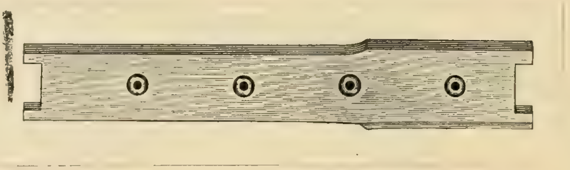
2 lb. Friction top cans, cases of 24.
2 lb. Friction top cans, crates of 612.
2½ lb. Friction top cans, cases of 24.
2½ lb. Friction top cans, crates of 450.
5 lb. Friction top pails, cases of 12.
5 lb. Friction top pails, crates of 100.
5 lb. Friction top pails, crates of 200.
10 lb. Friction top pails, cases of 6.
10 lb. Friction top pails, crates of 100.

Special prices on shipments direct from factory in the East or West.

100 5-lb. Friction top pails......	$ 8.50	Pint Mason Jars, flint glass, per gross	$9.00
200 5-lb. Friction top pails......	16.00	Quart Mason Jars, flint glass, per gross	10.00
100 10-lb. Friction top pails......	12.50		

A. G. WOODMAN COMPANY, Grand Rapids, Mich.

Do Not Raise Drones



Wires cut into all-wood frames and lose tension. Portions of honeycomb may sag when wires loosen. Worker brood is not reared in sagged combs parts; drones may be. Honey may clog sagged combs. Smaller crops, increased swarming often result. Eyeletted end-bar frames will help remedy this. Eyeletted frames are made available by Lewis "Beeware."

Wires do not rust at contact with eyelets. Less tension is needed in wiring eyeletted frames. Wires do not cut metal eyelets. **Sold only in packages of frames.** No eyelets or end-bars sold. End-bars have to be specially bored; eyelets fitted by automatic machinery. Furnished only by "Beeware" distributers.

Send for a "Beeware" catalog today. It's free.

LOOK FOR

BEE HIVES AND APIARIAN EQUIPMENT
BEWARE
WHERE YOU BUY YOUR
BEEWARE
WATERTOWN **WIS.** U S A
MAKES THE FINEST.
COPYRIGHT, 1916, BY G. B. LEWIS COMPANY

THIS MARK

"Beeware" is a registered trademark.

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EDITORIAL

League Advertising Fund.

ON PAGE 197 of this issue will be found a report of the meeting held by the American Honey Producers' League at Indianapolis. Among other things done at that meeting was the raising of a fund of $6,000 to help extol the merits of honey as a food, without naming any particular brand or locality. To that end an advertising propaganda in the magazine Good Housekeeping was proposed by one of the prominent advertising agencies; and so favorably was the proposition received that the amount was raised in about 30 minutes. It was suggested at the meeting that the larger beekeeping public, who were not represented at that meeting, would be glad to help swell this fund, and thus make the advertising much more effective. Here is an opportunity for beekeepers, thru their local organization, to help create a better market for honey.

◆

Attention Beekeepers of New York State.

A PROPOSED amendment to the village law of the State of New York, ''To regulate and prohibit the keeping of bees within the village limits,'' is now in the Senate of the New York State Legislature. Such a law would be clearly unconstitutional since it would abridge the right of citizens of the State to engage in legitimate business. When the far-reaching benefits of the honeybee to horticulture and agriculture in cross-pollination are considered, the beekeeper should not be compelled to beg for an existence, and beekeeping should be fostered by the State rather than hindered by adverse legislation. Every beekeeper in the State of New York, whether he has one colony or 1000 colonies, should write **at once** to both the senator and representatives from his district, protesting against the passage of this bill and urging the legislators to vote against Senate Bill No. 639, entitled, ''An Act to Amend the Village Law in Relation to the Regulating or Prohibiting the Keeping of Bees,'' if it should be reported from the committee on Affairs of Villages.

◆

Don't Get Cold Feet.

DON'T GET alarmed over Government honey-market quotations, even if the clouds on the beekeeper's horizon are a little dark just now. There is always a silver lining somewhere. It has been stated that thousands of the sugar-beet farmers, and likewise other thousands of producers of sugar cane, will raise some other crop this coming season. If that is a fact there is all the **more** reason for the beekeeper, who can not shift from honey to some farm crop, to stick to his job of producing honey. Furthermore, he should produce more largely of **comb** honey, which is still commanding a good market. If the sugar-beet farmers and sugar-cane producers have got ''cold feet,'' we beekeepers ''should worry.'' If there should be a shortage in sugar next year, we should worry. We would be very **smart** to produce all the honey we can. The man who gets ''cold feet,'' and gives up now, is very shortsighted, to say the least.

Above all things just now, when the bees are rearing brood so early, beekeepers should watch their colonies closely to be sure that none of them run short of stores.

◆

Early Brood Rearing.

THE REMARKABLY mild weather during February and early March has afforded beekeepers a splendid opportunity to note the variations in the beginning of brood-rearing under different colony-conditions. As a rule, winter brood-rearing is undesirable, and it is well to note just what conditions favor the postponement of brood-rearing.

Usually the colonies which are wintering the very best are the ones which begin spring brood-rearing latest. Such colonies, being quieter during the winter, are willing to continue their quiescence longer. Weak colonies usually begin brood-rearing earlier than stronger colonies. Colonies having old bees usually begin brood-rearing earlier than colonies having younger bees. Colonies that are restless because of a nervous temperament usually begin brood-rearing earlier than colonies of a quieter temperament. Colonies which are frequently disturbed are more inclined to begin brood-rearing early than those undisturbed. Colonies which have wintered on poor stores usually start brood-rearing earlier than those wintered on better stores. Colonies exposed either to very low or very high temperatures usually begin brood-rearing earlier than those in a moderate temperature. In this connection it has long been known that colonies of normal strength wintering well in cellars may postpone brood-rearing until after they have been placed on their summer stands.

The outstanding feature in all of these is some form of disturbance. Whether it comes from colony weakness, temperament, age, mechanical disturbance, poor stores, or temperature, the quiescence of early winter is finally upset and brood-rearing is begun.

Reports coming to this office indicate that in many cases the bees began rearing considerable brood in the cellars this year, some time before being put outside. This was probably brought about in some cases by the lack of a proper cleansing flight before being put into the cellars last November, as mentioned on page 10 of our January issue, and in other cases by the cellars being too warm during the winter. In many cases, no doubt, both of these disturbing factors have been at work, thus hastening the beginning of brood-rearing.

Just what effect this early brood-rearing will have upon the condition of the colonies later will depend largely upon the weather from now on. If no severe cold weather occurs later and if the bees rear brood only moderately in the North during April, no serious damage may be done except the using up of an excessive amount of stores.

* * *

Liming the Soil and Its Effect on Beekeeping.

IN PARTS of the northeastern United States where temperature conditions are favorable for the clovers, the soil is so deficient in lime that the clovers do not do well. In some regions when the soil could no longer support a growth of clover, farms have been abandoned because of the poverty of the soil. Within recent years many of these abandoned farms have been built up, and good crops are now being raised largely thru the use of lime and the growing of clover.

Extension men from the agricultural colleges are now preaching the doctrine of liming the soil. County agents and farm bureaus are not only telling farmers that it pays to lime the soil, but demonstrations are being made on farms here and there to show the great value of lime. As a result of all this, great areas in eastern Ohio and parts of New York and Pennsylvania, outside of the buckwheat region, which were formerly poor territory for beekeeping, are now becoming good beekeeping territory on account of the return of the clovers. The practice of liming the soil spreads from farm to farm, as neighboring farmers become convinced that it pays, until large areas of good clover territory spread from these centers where liming was begun several years ago. In most of these regions alsike clover has already been introduced and when once it gets into a locality it stays, if conditions are at all suitable, springing up in meadows, along roadsides and in fence corners.

Beekeepers in these regions will do well to find out where the most lime is being used by the farmers, as a guide in locating outapiaries, for where farmers are using a ton or more of ground limestone to the acre, beekeeping should flourish, if other conditions are at all favorable.

In this connection many beekeepers have noticed how much better the clovers grow along roadsides when the road is paved with crushed limestone, as a result of the worn away particles of the stone being distributed over the soil adjacent to the road.

In those regions where the soil is deficient in lime, beekeepers can improve their locations by seeing to it that the farmers of their vicinity are supplied with the best information available on the subject of liming the soil. Literature on this subject can be obtained from the various state experiment stations and agricultural colleges as well as from the United States Department of Agriculture at Washington.

* * *

Honey Used by a Colony During the Year.

ON PAGE 208 of this issue E. R. Root estimates the amount of honey used by a colony of bees for its own maintenance at 200 to 250 pounds per year in the southern States. This is the amount the bees must have before any surplus can be secured. While this amount may seem excessive to some, it is not so high as similar estimates made by others. The data which are available on this subject are meager, but they all indicate that surprisingly large quantities of honey are used by the bees during the active season.

Beekeepers have no means of knowing exactly how much it costs in honey for the bees to rear a given amount of brood, and we can only guess as to the amount of honey used by adult bees when they are active as during a honey flow. Some work done by R. L. Taylor in the Michigan Experimental Apiary in 1896 yielded figures indicating that four pounds of honey are used to produce a frame of brood, Langstroth size. These figures were obtained by carefully conducted experiments. Mell Pritchard reports that, in his queen-rearing operations, he feeds his cell-building colonies, after the honey flow, one quart of sugar syrup made of two parts of water to one part of sugar, which is about the equivalent, in sugar content, of a pound of honey. This causes the bees to rear brood at the rate of five frames of brood every 20 days, these five frames being removed from the brood-chamber every 20 days and placed above a queen-excluder. Five combs every 20 days is at the rate of one comb every four days, to produce which he feeds the equivalent of four pounds of honey. If no nectar is coming in from the fields, these colonies use a small amount of their reserve stores in addition to the quart of thin syrup per day. These figures agree closely with Taylor's figures of four pounds of honey to produce a frame of brood.

In 1901 Adrian Getaz collected all of the data which had been published up to that time in American beekeeping literature on the subject of ''feeding back'' extracted honey for the completion of unfinished sections. These figures indicate quite consistently that a colony of bees, when actively engaged in storing comb honey in sections, uses one and a half pounds of honey daily. In practically every recorded case brood-rearing was restricted, while the colonies were being fed, by reducing the brood-chamber to five combs. From this great mass of figures on feeding back Getaz concluded that 170 pounds of honey is the lowest amount consumed by a normal colony during the year.

Disregarding the brood reared previous to about April 1 and assuming that a colony rears two frames of brood during the first period of 21 days, five frames of brood during the second period of 21 days, and 10 frames of brood during the third period of 21 days, we have a total of 17 frames of brood, which, according to the above figures, cost 68 pounds of honey. Some colonies will probably produce 20 combs of brood in this time, costing 80 pounds of honey. This takes the colony up to about the first of June. Assuming an average of five frames of brood thru July and August, we have 15 frames of brood costing 60 pounds of honey. Assuming three frames of brood thru August and September we have nine frames of brood, or a total of 164 to 176 pounds for brood-rearing alone. To this must be added 15 to 20 pounds for winter and the amount of honey used by the adult bees when they are active during a honey flow. On this point we have but little information; but, if the above figures are nearly correct, normal colonies of bees must consume more than 200 pounds of honey annually, even in the North.

The large amount of stores needed for brood-rearing during the spring, in some cases apparently as much as 80 pounds, emphasizes the need of close attention as to stores during this time when the bees may not be able to gather much from the fields.

The Sequence of Brood Diseases.

IN THOSE areas in which both American foul brood and European foul brood are often found in the same apiaries, some beekeepers actually believe that one of these diseases turns into the other. So strong is this belief in some places that it is often discussed in beekeepers' meetings; and the idea has even crept into some of the bee journals, thus unfortunately adding to the confusion already existing in the minds of many beekeepers who have to contend with both diseases.

It should not be necessary to call attention here to the fact that the cause of each of the two most destructive brood diseases is positively known, the cause of American foul brood being a specific germ **Bacillus larvae** (White), and the cause of European foul brood being an entirely different germ, **Bacillus pluton** (White). The work of Dr. White in the investigation of the cause of these brood diseases has been verified by Sturtevant as well as other investigators; so there can be no reason for doubt as to its being correct. For **Bacillus pluton** to change into **Bacillus larvae** is just about as impossible as for wheat to change to corn, or tomatoes to change to apples.

Why should such a belief become prevalent among beekeepers? What could they have observed that could possibly lead them to such a conclusion? The explanation is found in the difference in the behavior of the two diseases.

European foul brood is usually at its worst in the spring, often disappearing later in the season, so that sometimes its presence can not be detected in the apiary even by a careful examination of the combs; while American foul brood persists thruout the season, usually growing worse as the season advances. European foul brood usually spreads with surprising rapidity thruout the apiary during the spring; while American foul brood, if not checked by the beekeeper, spreads slowly but surely thruout the season, especially during the robbing season. European foul brood is more destructive to weaker colonies, since strong colonies, especially if Italians, are better able to resist it; while American foul brood destroys the strong as well as the weak, often being found first in the strongest colonies.

When both diseases are present the beekeeper sees chiefly European foul brood during the spring and chiefly American foul brood during the fall, altho both diseases may be present thruout the season. The variation in the symptoms of European foul brood, by which it sometimes closely resembles American foul brood in appearance at first glance, may lead the beekeeper to think that he has only European foul brood in the spring, and the disappearance of the characteristic symptoms of European foul brood later in the season leads him to believe that he has only American foul brood left. If he send a sample to the Bureau of Entomology at Washington for examination in the spring when his trouble is overwhelmingly European foul brood he is almost sure to select a sample of this disease; and, if he sends another sample in the fall when European foul brood is difficult to find, he is almost sure to send a sample of American foul brood.

When both diseases are present a bad case of spring dwindling, following poor wintering, may be diagnosed as ''disappearing disease.'' The colonies thus weakened become easy prey for European foul brood. Even with this handicap the colonies may build up during the honey flow and clean up the European foul brood to a large extent, so that later in the season the beekeeper sees only American foul brood. Noting this sequence of evils the beekeeper may be led to the erroneous and absurd belief that one disease turns into another.

COLONY CONTROL

Some Important Facts Concerning the Behavior of Bees in the Defense of the Hive

By Morley Pettit

At the beginning of the active season it may not be out of place to consider some of the principles of colony control for necessary manipulations of combs and hive parts. For the comfort of the operator and for speed and efficiency, a thorough understanding of colony defensive behavior of honeybees is of the utmost importance; yet I cannot recall that this subject has taken any important place in the literature of beekeeping. It is more with a view to stimulate research than with the idea of telling anything new that I am presenting the following rough outline of the subject as it appears to a practical beekeeper.

First, the honeybee colony is never unguarded. There is no time when a hostile act does not produce a defensive reaction in a normal colony of bees. This varies with the condition of the colony, mainly from temperature, from a sullen buzz-z-z to a sally of scores or hundreds of armed guards. Hostile acts may be vibrations or sudden jars, quick motions in the sight of the guards, the opening of the hive, or the intrusion of foreign objects into the hive or in front of the entrance. The latter includes the activities of would-be robber bees.

Second, comparatively few individuals in the colony act as guards; but these few appear to be self-constituted, and take up defensive activity wherever the hostile stimulus occurs. The vast majority of the workers pay no attention to any but the most serious disturbances. If the stimulus is continued, more and more guards come to the attack until the excitement may spread to practically the whole colony.

Third, races of bees and individual colonies vary greatly in defensive behavior. Italians are, as a rule, much more gentle under the hand of an experienced beekeeper; on the other hand, they defend their hive more vigorously against robber bees. Perhaps the confidence with which they remain quiet under inspection is the same as that with which they kill persistent robbers, and it may be that the panic with which blacks run helter-skelter off the combs is the same fear which makes them easy marks for thieves of their own kind.

Fourth, young bees seldom sting, and the guards are usually older. Bees well filled with honey seldom volunteer an attack; but, when returning from the field with a light load or when carrying pollen, they are often much inclined to attack. A queenless and broodless colony defends itself poorly against robber bees.

Fifth, a normal brood-chamber is defended more vigorously than a super of honey. Bees will fight for open brood more quickly than for sealed brood and for open honey more quickly than for sealed honey. A special case here is that of a super of foundation or empty combs, especially if the latter are fresh from the extractor. If the operator is slow in getting the hive closed after adding either of these and gives the guard-bees time to come up thru in force, he is in for a good stinging almost in spite of all the smoking he can do. This seems to hold even tho one or more supers of honey may intervene between the newly added super and the brood-chamber. If a comb of brood and a comb of honey are left outside the hive with their adhering bees, the latter will guard the brood to the extent of stinging all comers, but may in a few moments be brushed from the honey without offering resistance. Before bee-escapes were introduced we used this principle in removing honey whenever there was sufficient flow to prevent robbing.

Sixth, the effects of various other conditions on defensive behavior are almost endless and are of great importance in practical bee management. In general a colony is more gentle when the temperature is high and the light is the brightest. Colonies in the sun are easier to manipulate than those in the shade at the same time of day. This is one strong argument against the use of shade in the apiary. It is the rule, practically without exception, that as we go down a row of hives, handling the sunny ones without difficulty, we can look for trouble as soon as we come to a hive that is shaded. To use common apiary language, they are mean, unreasonable, and—so on. On cloudy days resistance is always greater, and if it is just too cool for bees to fly, or if it is raining or has just been raining, it is simply awful. Not only is resistance greater, but the quieting effect of smoke is much less. This is often explained by the statement that on such occasions the old cranky field bees are all home; but, when we remember our second observation that comparatively few bees act as guards, we wonder how true an explanation this may be. It may be that the guards simply reflect the spirit of the hive, and that this spirit is tempered by the sum of the individuals which happen to be at home at the time. But that does not explain the case of the shaded colony which is storing just as rapidly, and presumably has as many fielders out as the ones in the sun. Often a weak colony puts up a hot, unreasonable resistance to examination, and such colonies will often refuse all the skill and blandishments of the beekeeper to introduce a queen, or to add more bees by ordinary uniting methods. It is notable in our experience that queens are more easily found in average colonies than in those which are below average strength. No doubt, she is more easily frightened into hiding where there are not so many bees.

Colonies are the most gentle of the whole season during the fine days of spring, doubtless because of the larger percentage of young bees. As the season advances they seem to grow more sophisticated, lose faith in man, and resist more vigorously from week to week his interference in their affairs. Colonies may be made bad-tempered by teasing or bad management; and, conversely, it would seem as tho a whole apiary grows better-natured by having frequent visits from people who know how to avoid irritating them. I have in mind a case where one lot of hives was divided in spring between two locations. One was without shade. near a dwelling, where the lady of the house who loved bees often sat among the hives to do some mending or similar work. The bees remained gentle all thru the season. The other was in an old orchard far from any occupied house. Cattle were pastured in the same field and no doubt disturbed the even temper of the colonies considerably. No one went near the hives except the beekeeper and his helpers, who gave each yard the same weekly attention. These bees became more and more cantankerous as the season advanced. This shows how the temper of bees may be developed in opposite directions by different environments, altho they are originally the same stock and receive the same care and attention from the beekeeper.

During a good honey flow colonies are usually most gentle and easily handled. As the flow cuts off they become cross. What makes the difference? Is it the robber bees which come picking around the entrances and keeping the guards constantly alert? The fact that the presence of numerous openings in old hives, which give robbers a better chance, makes the bees much crosser even tho no robbing actually occurs, would bear out this idea. No doubt the presence of fresh nectar in everybody's honey sac makes all hands good-natured; and conversely, the empty stomachs and the daily search for honey which is unrewarded set the colony nerves on edge. Whatever be the explanation which some scientist will no doubt give us in due course, we all know that everything runs more smoothly in the apiary during a good flow.

Applications in Practice.

Now what has all this to do with practical beekeeping? No doubt all commercial beekeepers have quit reading before this, so I will address the amateurs and beginners who may still be in the audience. The control of a colony of bees may be compared to the control of a nervous horse. The smoker represents whip and lines. One is needed as much as the other. With long practice it may be possible to drive a horse without lines, but it is not practical any more than to handle colonies without a good smoker. The latter must be ready to give a good full cloud of white cool smoke at all times. A good horseman lets his horse feel whip and bit just enough to know it has a master, and no more. He uses his control (whip and lines) just as much as the mood and disposition of the horse require, and no more. Directions are sometimes given like the following: "To open a hive blow smoke in the entrance, then raise the cover and drive some smoke in between the frames." This advice is given without any regard to the needs of the particular case. Did you ever hear a novice driver advised as follows: "On taking your seat in the carriage give the horse three vigorous jerks on the bit and cut him sharply around the body twice with the whip." Some horses might require such treatment on some occasions, but to make a rule of treating all horses in this way would be inconvenient at times. Bees are quite as nervous as any horse ever was, and will respond to gentle or rough treatment just as readily. It is necessary to keep the colony completely under control from the time the cover is removed until it is replaced. The amount of smoke required to do this will depend on all the conditions which have been very roughly outlined above—and several more. What smoke is used should reach the guards as a cool cloud, not as a blast. Smoke blown upon bees will excite them, when the same quantity of smoke reaching them without perceptible current or blast causes them to forget their resentment and go quietly about their business.

Smoking at the Entrance.

When conditions are favorable for good-tempered bees we seldom smoke the entrance at all. It disarms the entrance guards, increasing the danger of robbing, and excites the bees needlessly. If the queen is to be found, one might almost as well close up and go on to the next hive after smoking the entrance. She is very easily frightened into hiding, which makes it almost impossible to find her. If the frames are covered with a cloth they can be uncovered almost without jar, which is one great advantage of the cloth. At first, only a few bees nearest the light become guards and advance to the defense. A gentle cloud of dense smoke over the top-bars sends them back. Combs may then be removed and examined in turn. Perhaps every minute, or oftener depending on conditions, some guards lift their wings in an alert manner and require the gentle yet dense cloud of smoke to envelop them and cause them to subside. It takes experience and close watching to know just when the smoke should be used. If used too often all the bees become excited and run about, the queen cannot be found, and no work in that hive can be done with comfort. If left too long the guards dart at the operator, sting him, and he may lose his nerve and beat a hasty retreat. Then the fat is surely in the fire. On his return he is met by an angry mob which seem to know they have beaten him out, and it may be necessary to smoke them most unmercifully to get the colony in subjection again. Isn't that a lot like a horse? They are likely to remember you next time you come around, too.

As the season advances we find it necessary to use more and more smoke, altho we always use about as little as will let the colony know who is boss. One of the drawbacks of commercial beekeeping is that we cannot choose the most favorable time of day or weather for colony work. With apiaries crowding one another for attention, the work has to keep moving right along, no matter whether it is bright or dull and sometimes even when it rains. The manner of using the smoker has to make up for the difference.

Why Does Smoke Quiet the Bees?

Very often at bee-demonstrations the question is asked, ''What does the smoke do to the bees, what effect does it have on them?'' I think the answer invariably given by the experienced beekeeper who is demonstrating, is something like this: ''It causes them to fill themselves with honey, and bees in that condition do not or cannot sting.'' He may then show the questioner some bees on the comb he is holding actually filling themselves—and both are satisfied. But is that really the answer? Ask the same beekeeper about some manipulation which requires having all the bees filled, and he will explain that it takes at least 20 minutes of smoking and pounding on the hive to accomplish this. Yet in that time he would have subdued and examined thoroughly three or four colonies, without any thought of waiting for them to fill themselves. Take again the case of a swarm which has hung on a limb overnight until its guards are quite snappy; they are easily subdued with smoke when it is impossible for them to fill themselves, for lack of any source of honey.

Then what is the answer? That is for a physiologist to say. I would guess that the smoke causes irritation to some of the sense organs of the bee and draws its attention away from the intruder it was about to drive off. Since the defense of the hive is left to a comparatively few guards, that is enough to disorganize the defense and so keep the colony in subjection. The disorganizing principle is used more or less vigorously in some methods of uniting and introducing queens. The mildest type is the method where under favorable conditions a queen may be run in at the entrance, followed by a puff of smoke to disarm resistance of the entrance guards. A more vigorous form is the ''smoke method'' where the colony is confined entirely to the hive after receiving three strong puffs of smoke, and the queen run in at the saturation point of colony distress and disorganization. A more cruelly drastic method, which I have not seen recommended for many years, is the use of tobacco smoke to actually stupefy the bees before introducing the queen. Of course the attitude of the queen, whether one of fear or confidence, has a lot to do with the success of introducing methods. On the other hand, the different types of introducing cages seek to deliver the queen in the brood-nest under conditions which will not arouse any suspicion of her as a hostile element. However, a full discussion of introducing and uniting methods would add too much to the length of this article and may well be reserved to a future time.

Georgetown, Ont.

THE CALL OF THE SOUTHLAND

Some of the Difficulties of the Country

By E. R. Root

OH, this beastly weather! will it ever let up? these never ending colds? these snuffs and snorts? Would that I could go where it is not cold, and where I could breathe thru my nose, and without catching cold!''

I wonder how many of our readers located in the North, suffering from the extreme cold, have not said this, and wished time and again they were in a milder climate, or that spring and summer would come. Almost daily we get letters from beekeepers who say either they or some member of the family can not stand the cold, and want us to tell them of some good bee locations in the South. With the view of helping these people, and even others who for various reasons, would like a change, I may be able to offer some suggestions.

In the first place, let me make it clear that sometimes one will suffer more severely in the South from chilly air that seems to go clear thru one's bones than he will in the North, where he can get near a stove or a steam radiator. While the winters in the South are very mild, there are days all thru the Southland, and in California, that are decidedly unpleasant, damp, and chilly, and when an overcoat affords none too much warmth, and where a fireplace indoors allows one to bake himself on one side and almost freeze on the other. While it is not very cold in the South, there are many days there when the temperature is down to 50 degrees, and even slightly below freezing. During these times I think one will suffer as much as or more than he will in the North when the temperature is down to zero with a dry atmosphere. But it is fair to say that the greater part of the days in the South are very comfortable; and the further south one goes, the more it is like summer in the North.

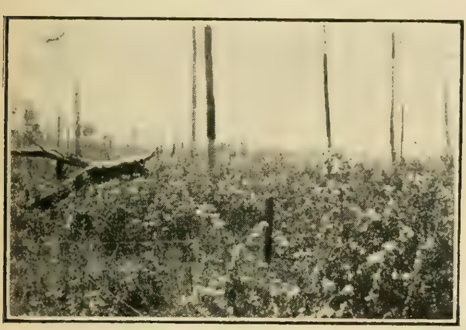


Fig. 1.—A typical gallberry and blackberry country, stretching from North Carolina to Louisiana. The blackberry yields a dark-colored honey of inferior flavor; but it is invaluable for boosting brood-rearing.

Many of the readers of this journal are interested in knowing what they can do with bees in a warm climate, and would like to know the sources of honey, and whether it is possible to make a living. As to the last I can say yes and no.

As I have often said before in these columns, one must take time not only to acclimate himself but to learn that bees must be handled somewhat differently. While they do not freeze to death in the winter, I will venture to say that there are more bees that die in the Southland from starvation and what we might call spring dwindling than actually die of winter cold in the North. Moreover, bees there require twice or three times the amount of stores necessary in the North to carry them thru from one main honey flow to another. Almost constant breeding wears out the queens so that they are seldom good for anything after the first year; and in some localities in the South the time will come, I think, when beekeepers will discover that it will pay them to requeen twice a year.

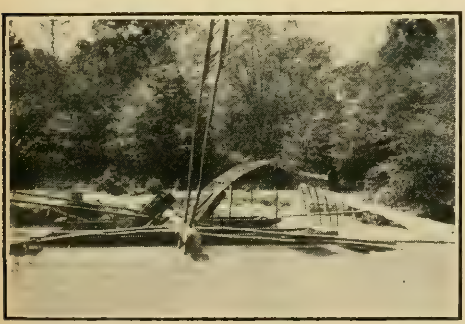


Fig. 3.—The banks of the Roanoke almost its entire length are covered with honey-bearing flora, mainly tupelos and black gums with some gallberry and blackberry. The apparatus shown close to the shore is an automatic fishing machine for catching herring.

In going south one should remember that he will not see much white clover; and what there is, is of but little value. Starting from Virginia and North Carolina he will find growing on the coastal plain near and up to a hundred miles from the coast, gallberry, tupelos, black gums, blackberry, high and low bush huckleberry, and titi. Thru Virginia, North Carolina, South Carolina, Georgia, and Alabama, much of the territory along the swamps, rivers, and bays is acid, so that the white clovers can not grow. But this very acid condition is favorable to the growth of the gallberry—a very welcome substitute for white clover, that requires a sweet soil. This same sour soil, so favorable to the growth of gallberry, is likewise unfavorable for the growth of the malarial mosquito. If it were not for this condition

Fig. 2.—This picture was taken thru the wind-shield of a Ford automobile that was "fording" the so-called road lengthwise. On either side of this road are gallberry, blackberry, high and low bush huckleberry, tupelos, black gums, and dozens of other honey plants.

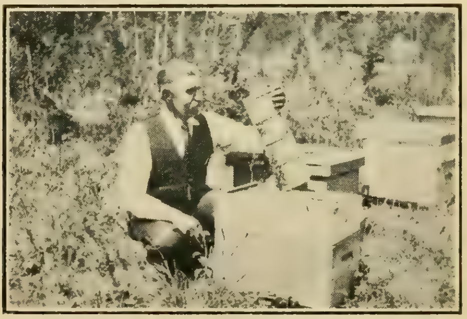


Fig. 4.—Charles Duvall, of the Duvall & Leggett Co., Williamston, N. C. He is looking at several of his comb-honey supers during the second week of April, when the editor was at his apiary. It is honey from hawthorn and crabapple largely.

no white man would be able to live in this swamp country.

The very best honey found on this coastal plain is undoubtedly the gallberry when it is free from titi or honey from any other source. A pure gallberry honey, say those who ought to know, is almost an exact duplicate in body, color, and flavor of white clover; but, unfortunately, a pure gallberry honey rarely reaches the northern markets. Other honey sources are so mixed with it that its quality is greatly impaired. Those who ought to know, again, say it is possible in most of the sections where it grows to produce a pure gallberry honey for the northern markets, and such honey could be used by the bottlers and canners in place of white clover. If the contents of the bottle or can are labeled ''Honey'' the northern honey-eating public will accept gallberry as readily as white clover, because it has a flavor they are accustomed to, and therefore they like it.

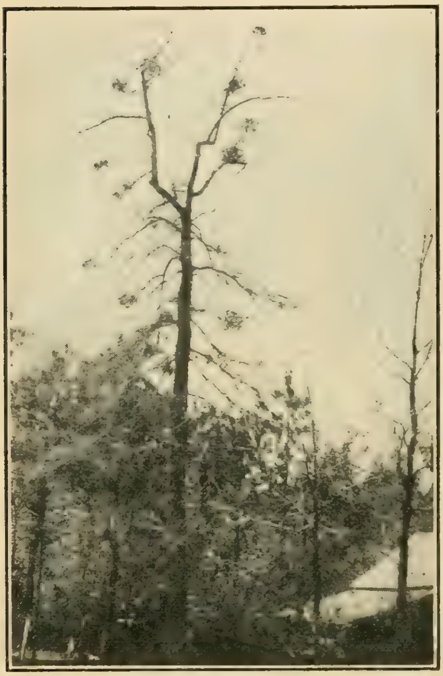


Fig. 5.—A fine specimen of highland black gum in North Carolina.

Next in order of quality are the black gums and tupelos. While these are beautiful white honeys they have just enough ''difference'' so that the housewife of the North does not accept them as she does the gallberry or the white clover. Then comes titi, which has an off flavor, and should never be allowed to be mixed with gallberry. It should be sold to bakers and manufacturers. The same might be said of blackberry honey, which is decidedly dark-colored, and of medium flavor.

One of the very best sources of honey is the partridge pea of northern Florida. This is a good honey, but it does not begin to compare with gallberry.

Another important source of honey in northern Florida is the ''summer farewell,'' and some seasons along the rivers and bays the mangroves. Saw palmetto and scrub palmetto yield a very fine-flavored honey; but it seldom reaches the North, as most of it appears to be consumed in the South.

Thru the central portions of the southern tier of States, or what is usually called the Piedmont section, are cotton, a little clover, some crimson clover, and fruit bloom. In the mountain section will be found the poplars, sourwood, and other tree honeys, as well as fruit bloom.

While the coastal-plain country is not developed, it is unquestionably the portion in the southeastern States that is the best for bees; and any one desiring a milder climate and a good bee country, and can stand the swamps and mosquitoes, will find this the place to which he may go.

One will find a market for practically all the honey he can produce in the South. If climate or health is a matter of consideration one should make up his mind that his bees will have to gather from 200 to 250 pounds of honey for colony maintenance before he can get a surplus. So much honey is

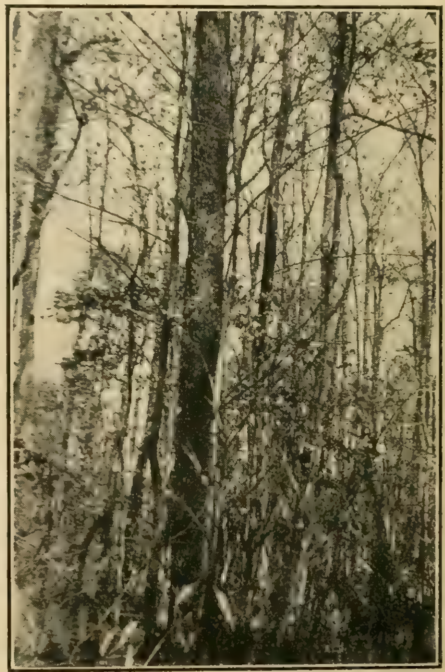


Fig. 6.—A typical white-tupelo wood with one fine specimen in the foreground. This is on swamp land.

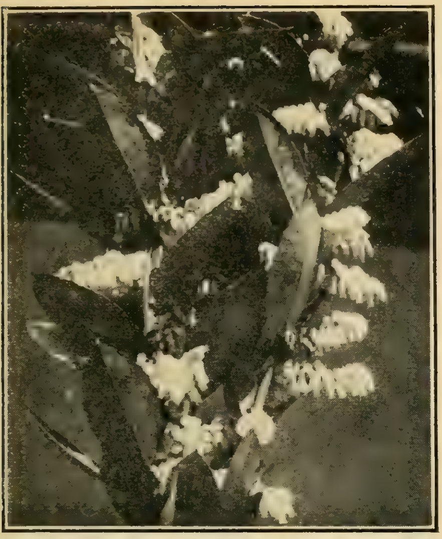


Fig. 7.—The plant and blossoms of the titi. This yields an inferior honey and a large quantity of it. Unfortunately, it is often mixed with gallberry and other honeys of good flavor.

consumed in constant brood-rearing and flying every day for 11 or 12 months that the beekeeper of the Southland should figure on at least two or three pounds of honey to maintain a colony to every pound he will get for surplus. In many instances the ratio would stand four to one. In the far southern States some of the best beekeepers admit that, during the winter, their bees have to raise two or three families of brood before they can get a family to gather the honey. That means that the hive will have to be filled with brood two or three times, each generation dying off before the third or fourth generation can gather the main crop.

On the other hand, northern bees, during winter for five or six months, are in a semi-dormant state, during which they raise but little brood, consume very few stores, and last, but not least, require no attention.

There are wonderful opportunities in this southeast section of the Southland; but unless the beekeeper can adapt himself to the conditions he will make a mistake by moving from the North to the South.

After having been editor of Gleanings for the last 36 years I have come to this definite conclusion: Barring some exceptions, the average beeman will do better in a locality where he has spent most of life than he will to move to some other locality where the conditions are radically different. It really takes years to learn a locality; and I have observed many and many a time that the new beekeeper moving to the South is at a very great disadvantage compared with a man who has lived in the Southland all his life. So I say, stay where you are unless your health or some other consideration absolutely demands a change. From a financial point of view you will, the first year or two, lose money.

I have come to the conclusion that most localities in the United States have their decided drawbacks as well as their good features. It is the drawbacks that the tenderfoot, or new man, encounters that put him to a great disadvantage. Yes, I think the greater the bee country the greater are some of the obstacles to be overcome, and this is particularly true of southeastern United States and in California.

In California particularly, especially in the southern part, European and American foul brood are rampant. Both diseases have obtained an awful foothold, as brood-rearing can progress there more or less all the year.

While California is a wonderful bee country, producing more carloads of honey than any other State, there are more failures and partial failures of the honey crop there than elsewhere. However, good beekeepers are making money there.

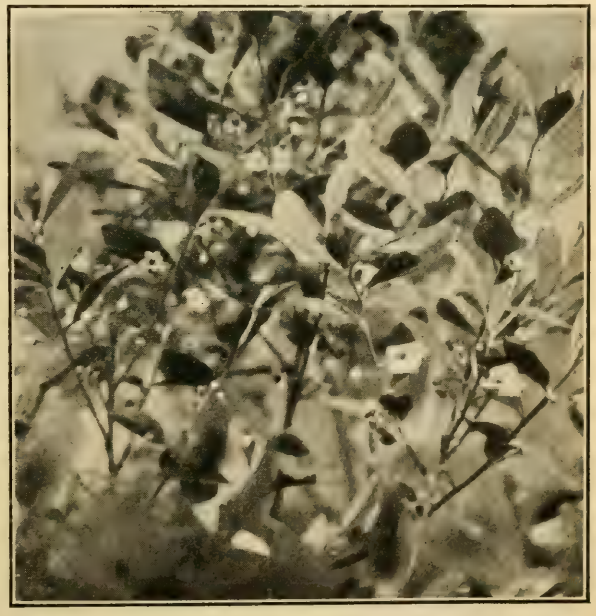


Fig. 8.—A dense mass of gallberry bushes. This plant yields honey that is practically a duplicate in body, color, and flavor of white clover. The blossom that yields the honey is a small raylike flower about ⅜ inch in diameter. The honey from it is so superior that, when the plant begins to yield, the bees will leave white tupelo that may be secreting nectar so abundantly that the little transparent globules of nectar may be seen in the blossom along the roadside, and seek the gallberry.

SPRAY POISONING

How the Bees Obtain the Poison and How This Can be Avoided

By Dr. A. L. Melander
State Entomologist of Washington

FRUITS vary in their necessity for cross-pollination from complete self-sterility to self-fertility. Some of the best-known commercial varieties of apples, pears, cherries, etc., are entirely dependent on pollen from other flowers. Even in case of self-fertility it has abundantly been demonstrated that more perfect fruit results from cross-pollination than from self-pollination. Bees, either the many native wild species or the hive-bee, are the most important agency for carrying pollen from flower to flower. From the point of view of fruit-growing, therefore, every thing possible should be done to propagate bees, particularly the honeybee.

Progressive fruit-growers appreciate the importance of bees in setting a crop of fruit and commonly rent colonies of bees for the blossoming period, paying $5.00 per colony and allowing one colony to each acre or two of orchard. The increasing custom of growing a honey-producing cover crop would make the combination of orcharding and beekeeping particularly desirable, were it not that some fruit-growers overdo their spraying so as to allow spray poison to drip from the trees. This poison, falling to the blossoms of the cover crop, is taken up by the bees and has resulted in the destruction of so many bees as to cause commercial beekeepers to move away to safer zones.

In return for their good services many bees meet a pitiful death at the hands of those they help. For two or three days after the spraying of an orchard nearby bees frequently die in numbers. The field force first is depleted, either failing to return or sometimes bringing into the hive sufficient poison to spread agony and destruction to brood and nurses. Many colonies of bees have been completely exterminated. Others have been so harmed as to fail to build up even in time of full honey flow and later succumb to disease and winter-kill. Instead of producing honey these colonies must be fed that the remnant survive.

Source of the Poison.

Bees secure poisonous fruit sprays as a result of the following improper horticultural practices:

a. From the drip upon honey-producing cover crops grown under the trees. This is the fault of excessive application.

b. From spray reaching fruit bloom. This is the fault of spraying too early, before the blossoms have dropped.

c. From spray mixing with honeydew, the excretion of plant lice. This is the fault of neglecting to keep plant lice under control.

Another doubtful source is from foliage before the spray has dried. This is insignificant as compared with the others, on which it is largely consequent. Bees would not frequent the orchard if there were no honey available.

Symptoms of Spray Poisoning.

Arsenic is a quick-acting poison; hence those bees that secured a full toxic dose fail to return to the apiary. Countless dead bees have been noticed between the orchards and the apiary. Especially about their watering places do the bees congregate, visiting moist ground, a brook or a ditch, as tho in an endeavor to quench the burning away of their organs. Many come back to their homes laden with pollen and poisoned honey, but drop fagged out, instinctively remaining outside to die.

Those that receive poison close by may deposit their load in the combs before becoming affected, unwittingly spreading agony to the nurses and the brood. Few of the poisoned bees die within the hive to be carried out. Such is the remarkable instinct among bees, where the family comes before the individual, that when the bees reach the stage of poisoning characterized by a diarrhoea they crawl forth even thru the night to void the poison outside of their home.

The next morning after the spraying was done the field workers sally briskly forth, but because the poison in their system has paralyzed the wings their attempt at flight results in failure. Down they drop from the alighting-board—usually never to arise again. At first excited and nervous they scurry about, climbing up weeds and grass, clustering on the outside of the hive, which because of the diarrhoea afflicting them they spot profusely. With wings quivering they jump along, trying to fly a few inches at a time, gradually getting further and further away from the hive. In a few minutes a stupor overcomes them; they have less and less control over their movements; they are barely able to crawl; they fall over on their sides; some spin on their backs; they clutch convulsively with their legs; their tongues become extended full length. As the paralysis becomes complete they quiet down, accumulating in depressions of the ground 20 or 30 feet from the apiary by handfuls or even by literal quarts. Their mission in life is over, altho unfulfilled.

As the sun warms up, some of these afflicted in less degree revive sufficiently to fly or crawl away from the vicinity of the hives. Such bees probably never completely recover. It is doubtful if they ever return, for we have noticed that other insects once stricken with arsenic become unable to digest food, and tho they may linger on for days and even weeks finally die of starvation, if not of poisoning.

The poisoned honey brought into the hives kills the nurses and young bees. Drones and queens are also affected; one observer reporting, however, that in some colonies everything was killed but the queens, so that he had a dozen lone queens surviving. The brood in all stages is destroyed. Sometimes only unhatched eggs remain after the plague has swept thru, the helpless new brood appearing but to perish unattended. In case of incomplete destruction of the colony, poisoned honey is stored away to be drawn on later, when symptoms of arsenic poisoning reappear. Such after-effects are common when bees are removed from the orchard region. Thus it is also that bees may show symptoms of poisoning early in the spring before the spray season opens.

Financial Loss to Beekeepers from Spray Poisoning of Bees.

Questionnaires sent the past two seasons to beekeepers in the fruit-growing districts of Washington reveal the widespread and serious nature of spray poisoning. By tens of thousands colonies of bees are being so depleted as to become non-productive, and by thousands colonies of bees are being completely wiped out. The money loss for a season has been computed to be more than $50,000.

Aside from financial considerations there enters the question of fair play and moral and legal rights. Why should one group of people be permitted to put poison in the path of so industrious a benefactor of humanity as the honeybee? When it is further realized that bees are all-important to fruit-growing the question becomes even more pertinent, for it becomes suicidal to best orchard interests to drive away the honeybee and to destroy year after year the native insect pollenizers.

To avoid actual extermination beekeepers are forsaking the orchard districts. It is their silent protest but best retaliation to their neighbors who manifest so little regard for the rights of others. Bees are gradually becoming a rarity in those districts where they are most needed.

Correction of the Trouble Involves No Actual Hardships.

If bees are to be won back and propagated in the fruit-producing districts the following conditions must be met.

a. The calyx spray must not be begun until fully 80 per cent of the blossoms have dropped. This is consistent with best spraying practice. At that time the nectar flow has ceased.

b. Cover spraying should not be overdone. A tree will drink up a definite amount of spray without dripping and nothing is to be gained by spraying beyond that point. A careful operator can spray an orchard with utmost efficiency and yet have scarcely a drop fall on the cover crop.

c. Cover crops should not be permitted to bloom at the time of spraying. Practically this is usually accomplished by cutting before driving thru with the spray outfits. This avoids the poisoning of nectar and removes the inducement to the bees to visit the orchard while spraying is in progress.

d. Aphids must be kept in check on such varieties of fruit as receive summer applications of arsenicals. This would avoid the production of honeydew to become contaminated.

It is the overzealous fruit-grower who, whitening his apples and his alfalfa, should be made to understand that it is his desire to best the codling moth that is giving Washington apples the reputation of being poisonous to eat, that is responsible for the impression that orchard-grown hay is deadly to horses and cattle, and that is driving away the best supporter of his industry—the beekeeper.

It may prove that some suitable material will be discovered that can be added to the spray as a repellent to bees, thus enabling the fruit-grower who wishes to keep bees to grow his alfalfa and do his spraying without further regard for his little friends. Lime-sulphur, nicotine, lime, and creosote have each been suggested for this purpose, but information is too meager to give out a general recommendation as yet. In some preliminary experiments we have conducted we have found that bees react in unexpected ways to substances nauseating to ourselves. Lime-sulphur, carbon disulphide, and naphthalene were preceptibly avoided by bees; while ill-smelling butyric and pyroligneous acids were unnoticed. It may be that calcium arsenate will be less destructive than the lead arsenate; it may be that dry dusting will be better than liquid spraying.

Corrective Legislation Will Afford the Quickest Benefits to All.

While it is inconceivable that any fruit-grower conversant with the facts would wilfully place poison in the path of his neighbor's honeybees, yet we all appreciate how slow is the directing of reforms thru appeals for sympathy. In the meantime the beekeeper must live by the lives of his bees. His part is not to beg for humane consideration of his troubles; he cannot wait on educational propaganda; he cannot take chances on losing his all; and so he moves away until fruit-men come to realize that they need the bees more than the beemen need the orchard flowers.

Many States in the interest of beekeeping have enacted laws prohibiting the spraying of trees in blossom. This alone would not meet the situation in the Northwest, because the custom here of growing a cover crop is responsible for most of the trouble.

For the ultimate good of fruit-growing, as well as of beekeeping, Washington should enact a law to forbid the placing of poison inadvertently or deliberately, where bees or other insect pollenizers will unavoidably secure it. Such a law would apply only to the careless orchardist, who would either have to cut his alfalfa before spraying or else hereafter use care in spraying not to overdo the application.

FIREWEED, OR WILLOW-HERB

A Great Honey Plant of the Far North, Extending Into This Country in a Few Places Only

By F. W. L. Sladen, Dominion Apiarist

FIREWOOD, or great willow-herb **(Epilobium angustifolium)**, belongs to the evening primrose family. It is a tall plant two to seven feet high, bearing long spikes of large rose-pink flowers, which have only four petals. The plant is a native of the northern parts of Europe, Asia, and America. It has a more northern range than any of the other principal honey plants, and is common in many parts of Canada. Across the continent it is more widespread and less subject to failure in flowering two or three hundred miles north of the international boundary than to the south. In Canada, it is most abundant in British Columbia, both in the mountains and on the coast. It is common in central and northern Alberta, northern Saskatchewan, in Manitoba, particularly around Lake Winnipeg and in the low moist lands of eastern Manitoba, in northern Ontario, particularly in the Rainy River district and in the clay regions, also around Lake Temiskaming, and in burnt-over areas in Quebec and the mariime provinces. In Canada, fireweed reaches its greatest development, both in height of the plant and in the number of flowers to the head, in the Lower Fraser Valley of British Columbia. It is most dwarfed and the flowers are fewest at the highest altitudes.

Springs up After Forest Fires.

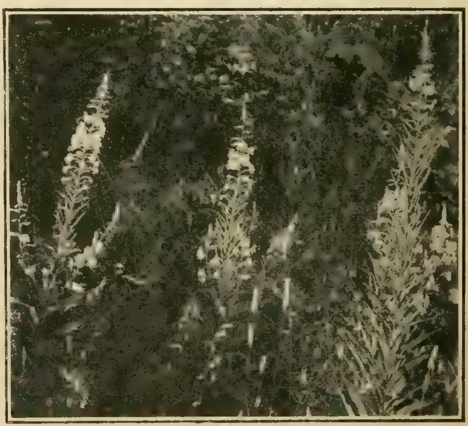
The chief feature about fireweed is that it is apt to spring up in great abundance on newly burnt forest and bush lands. In the more southern part of its range it dies away after a few years, being crowded out by other plants. In some places, for instance at the lower end of the Gatineau Valley in Quebec, wild raspberry, also a good honey plant, is one of the first plants to replace it. Among other honey plants that may follow it are Canada thistle, goldenrods, asters, and willows. Near Maniwaki in the Gatineau Valley, about 100 miles north of Ottawa, a fireweed location was practically exhausted about six years after the fire that produced it; but over 100 miles further north, near the height of land about halfway between the city of Quebec and Lake St. John, in a place where the local inhabitants said a fire had occurred 15 years before, a fair amount was still flowering. Flowering plants are scattered, but not very thickly, in clearings all along the Canadian National Railway that traverses northern Quebec and northern Ontario, east and west of Cochrane, especially in low wet places.

At Hector, B. C., 5200 feet altitude, and Glacier, B. C., 4000 feet, the highest points in the Rocky Mountains and Selkirk Range on the Canadian Pacific Railway, numerous large patches of abundant fireweed in flower remain year after year and show no signs of diminishing, but how far it would be profitable to keep bees in these locations has not been determined. Between Lacombe and Edmonton in Central Alberta, fireweed will appear and flower well in wheat fields in patches where the grain has failed to grow, and it is fairly common in the scrub lands.

Heavy Yields of Nectar When Conditions Are Favorable.

In a good year in a good fireweed locality, large yields of honey have been obtained. W. H. Turnbull, who keeps a small apiary on the Pacific Coast at Sullivan Station, near New Westminster, B. C., writes:

"Last year my two best colonies gave me 550 pounds each. I am satisfied that this was mostly, if not all, from fireweed, which grows around here in great profusion. I have my apiary on the edge of a swamp, and my bees get nectar from the fireweed growing there when the bees on the higher ground are loafing and robbing. This season, owing to dry, hot, and smoky weather, the fireweed crop was short."



Fireweed on a mountain side in British Columbia.

A colony on scales in a large apiary at Montcerf, Quebec, about 100 miles north of Ottawa, gained over 20 pounds a day from fireweed for several days around August 12, and the average annual yield for six years was 144 pounds to the colony, of which, probably about 100 pounds was from fireweed.

The nectar is on the surface of the flower, wholly and easily within reach of the honeybee. Under the most favorable conditions for nectar secretion, the nectar in each of the four nectaries is produced in such a large quantity that the four drops coalesce, forming a large drop that can be shaken from the plant.

An examination of fireweed flowers in many places in northern Ontario by the writer in July and August, 1918, showed that they secreted nectar more readily and under a greater variety of soil and weather conditions than alsike and white clover. The honey flow also lasts longer than that of clover. In the Gatineau Valley it begins one or two weeks later than clover, about July 10, and goes on until about Sept. 5. It thus covers the whole of the best part of the summer after the bees have had plenty of time to build up. Each main stem carries numerous flower buds; those at the bottom open first, and the flowers slowly ascend so that several weeks elapse before the top buds open. Flowering side shoots also develop.

In the warmer valleys of the southern part of British Columbia the plants start to grow so early and develop so quickly that many come to an end of flowering a good while before the end of the summer; but in the north, they continue flowering until there comes about five degrees of frost, which is severe enough to destroy the bloom. In northern Ontario, this killing frost often comes as early as the last week of August.

Fireweed likes moist ground and a cool temperature. As in the case of other plants, cool nights and warm days cause the greatest nectar secretion. Mr. Turnbull's statement that his fireweed yields best on the edge of a swamp is in line with a remark made to the writer by F. Dundas Todd, that it "needs to have its feet wet," and with observations made at Monteith, Ont., where in burned-over clay ground that was so moist that it was covered with green moss and liverwort, a very copious secretion of nectar had taken place on a sunny morning, Aug. 7, 1918.

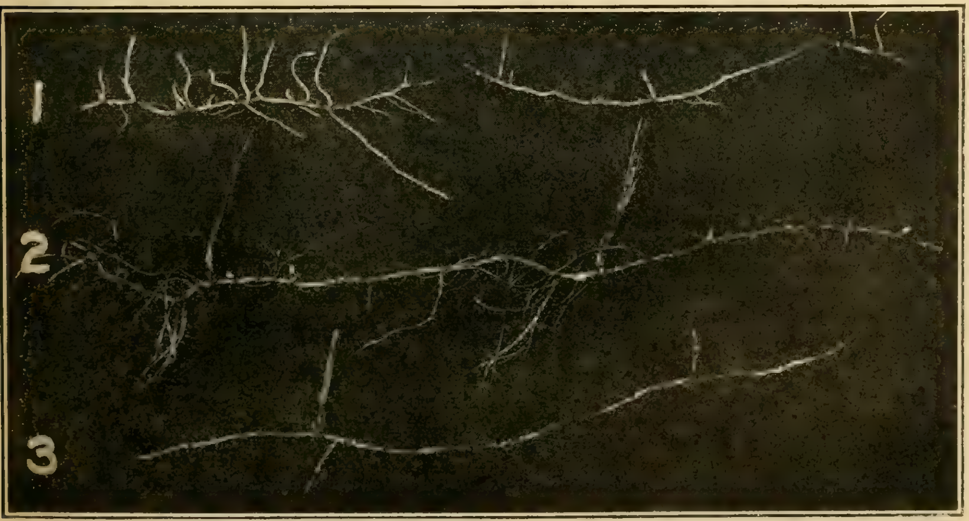
Drainage is probably important, as I have frequently noticed poor growth and poor secretion in undrained swamps.

Unfortunately, the best areas for fireweed-honey production are often hard to reach and are seldom utilized by beekeepers. The loss of the apiary by a fresh forest fire must be guarded against in some places.

Different Methods of Propagation in Different Regions.

In eastern Canada repeated dry, warm seasons weaken the plants and cause them to die out. In the frequently dry and warm region near the junction of the Ottawa and Gatineau Rivers at Chelsea, Quebec, it was noticed that, after a fire the fireweed developed, not from the seed which was blown all over the country in the fall, but from the rootstocks of scattered plants that had been existing in the bush in a languishing state without flowering. Directly after the fire, these rootstocks threw up strong plants and developed rapid root growth, which traveled over 20 feet in different directions and produced buds at short intervals. The following year each bud produced a flowering plant and a further extensive network of rootstocks. Numerous seedlings were watched; it was noticed that all died except those that were kept continuously moist on the borders of streams in wet places.

On the other hand, at Monteith, Ontario, in a cooler moister country about 200 miles further north, a splendid stand of fireweed was found in a moist clay bush land that



Hibernating rootstocks of fireweed from near Ottawa, Ont., in October. 1. In newly burnt ground. 2. An older root. 3. An isolated old root from the bush, no longer flowering. The buds are smaller and less plentiful as the root grows older.

had been burnt over the previous year, the dead trees still standing and affording considerable shade and protection from wind. Scattered thru this stand were solitary stalks of a white-flowered variety of fireweed, showing clearly that this stand had developed from local seed and not from the creeping rootstocks. Much of the land, covering many miles along the railway north and south of Montieth, that had been burnt over at the same time, showed little or no fireweed. Some of this land was dry or sandy, and in parts of it there had sprung up instead of the fireweed the annual fleabane, or horseweed **(Erigeron canadensis)**, which is the fireweed's principal rival for the occupation of newly burnt-over land. This plant unfortunately gives no honey. While fireweed prefers clay and particularly soils rich in humus and even the rotting remains of fallen trees, it will grow in the north and spread for a while in soils that are rather sandy, and often grows partcularly well on rocky ground that has been burnt over.

Travelers to the Yukon and other parts of the far north of Canada have often remarked the fireweed which is prevalent as far as the forest extends, even to the delta of the Mackenzie River.

Another Species in Far North.

In the artic and in the glacial streams high up in the mountains of British Columbia there abounds another species of fireweed, **Epilobium latifolium.** This species grows to a height of less than one foot and has broader leaves and larger flowers than **E. angustifolium**, and it blossoms profusely. It is common on the low, often temporarily submerged, sandy and gravelly islands and the shores of the arctic rivers.

The writer has seen a good deal of fireweed that would have made a good stand, but for the fact that its blossoms were few and puny or failed to develop from the flower buds, and the plants had a weak and sickly appearance. In some cases the leaves were riddled with holes. These plants were in the Rainy River district, both on the Ontario and Minnesota sides and in the Gatineau Valley and near Lake Temiskaming. They were mostly in stands that were known to be old and fast deteriorating, and it was noticed that the roots were brown and rotting at the heart. The plants in the more northern and mountain regions were always vigorous and had large flowers.

So far, our knowledge of the commercial possibilities of fireweed as a honey plant is practically confined to the southern part of its range where it lasts only a few years after a fire. For the higher and more northern places where it lasts permanently, we have hardly any information, but rather high yields reported annually by a beekeeper near Melfort in northern Saskatchewan are probably mainly from this plant, which the writer has seen in abundance there.

Fireweed honey is almost water-white and has good density and a very mild flavor. It granulates after extraction.

The seed of the fireweed is very small and has long down attached to it. It is borne in long narrow reddish pods which burst and liberate the downy seeds in great quantity. These are blown thru the forests in the fall, sometimes in such quantity as to make the eyes of the moose-hunters sore.

Possibly on account of the absence of a strong scent, it sometimes takes the bees a few days to discover the fireweed when they have been working on other plants.

Ottawa, Canada.

COMB HONEY PRODUCTION

Importance of Heavy Brood-Rearing at Just the Right Time

By Geo. S. Demuth

THE statement has often been made that successful comb-honey productioney requires that the colonies be rousing strong at the beginning of the honey flow. Quite true, but the same thing is also true for best results in extracted-honey production. While it is possible to secure some surplus honey from weak colonies by supplying them with extracting combs instead of with comb-honey supers, it certainly is no less desirable to have powerful colonies at the beginning of the honey flow when producing extracted honey than when producing comb honey. The difference, if any, between the condition desired by the beekeeper when colonies are to produce comb honey is in the compactness of the brood, which is so desirable for comb-honey production. The brood may be more scattered when producing extracted honey, tho even then most beekeepers prefer to have the brood in compact form. The problem of the comb-honey producer previous to the honey flow is therefore not materially different from that of the producer of extracted honey.

In most of the territory where comb honey is produced commercially in this country the main honey flow begins some time in June and is often so short that the eggs that are laid after the honey flow begins, result in bees which mature too late to take part in gathering and storing the crop of honey. Wherever, therefore, the honey flow begins in June, most of the workers that gather the crop must be reared during April and May, and in order that they may be young and vigorous for their work the vast majority should be reared during May.

The "Harvest Hands" of the Hive.

These workers are the "harvest hands" of the hive; and, if the flowers and weather do their part, the crop of honey will usually be much or little according to whether the workers to gather it are many or few. A great horde of workers coming on the stage of action at just the right time is the goal toward which the beekeeper has been working since last summer. So far as he is concerned, this great army of workers is that for which all the workers born at other times have existed. The bees reared previously have been useful only in as much as they have contributed to the final production of these "harvest hands," and bees reared later are useful only in as much as they are able to contribute to the maintenance of the colonies until next season unless there is a later honey flow which they may help to gather.

Most Important Period of Brood-Rearing.

This period of brood-rearing, therefore, has a significance not found at any other season. Whether the main honey flow comes in March and April as among the orange groves of California and in the tupelo and orange regions of Florida, in June and July as in the clover region of the North, or during August as in the buckwheat region of New York and Pennsylvania, the size of the crop of honey that can be harvested depends largely upon the amount of brood reared during the six or eight weeks just preceding the beginning of the honey flow.

Tendency to Rear Brood Strongest in Spring.

When the bees begin brood-rearing in earnest in the spring the tendency to rear a large amount of brood is the strongest. This is especially true in the North where the spring brood-rearing reaches its maximum during the latter part of May or early in June. If conditions are favorable for heavy brood-rearing at this time, the amount of brood in the hive is increased rapidly until the peak is reached, after which it is reduced so that there is usually less brood in the hive thruout the remainder of the season. If anything, such as weakness or insufficient food, prevents the colony from reaching its peak in brood-rearing in the spring, it may climb to its peak later in the season when normally the tendency to rear brood would be less intense; but, after the first spurt of extensive brood-rearing of the season, it is difficult to induce colonies again to rear anything like as much brood during the same season.

Time of the Main Honey Flow in Relation to Spring Brood-Rearing.

In some locations, such as in some of the southern States and in a strictly buckwheat region, the main honey flow may come as much as two months after the bees have passed the peak of spring brood-rearing, assuming that the colonies were normal in strength and had sufficient food to have reached their maximum in brood-rearing in the spring. In such cases some beekeepers resort to such measures as stimulative feeding or spreading the brood, to induce more brood-rearing just previous to the main honey flow. Others move their bees to another location to gather a crop of honey from some earlier source while the colonies are strong, and then move them back again for the later honey flow. Some southern beekeepers sell package bees to utilize the excess of workers which would be too old to be of use when the honey flow comes on later; while still others divide the colonies before they reach their peak in spring brood-rearing, performing the division at a time which will permit both colonies to build up to greatest strength in time for the belated honey flow. The last-named plan has been used quite successfully in the buckwheat region.

When the main honey flow comes at the same time that the bees are rearing the great horde of "harvest hands" in the spring, as too often happens in the case of weaker colonies and an early honey flow, of course a full crop of honey can not be secured, for the field force is then small and the amount of brood to feed is large. The only hope in such cases is that the honey flow will last long enough for colonies to become strong enough to gather some surplus before it closes, but the remedy is better wintering and earlier building up.

When there is a possibility of a honey flow still earlier, at the beginning of the heavy brood-rearing period of spring, as sometimes happens in the North when the maples yield profusely, or in the citrus region when the bloom comes unusually early and the bees are late in building up, brood-rearing is greatly stimulated and but little honey is stored because of a lack of "harvest hands."

Fortunate, indeed, is the beekeeper whose location furnishes the main honey flow of the season immediately following the period of natural spring brood-rearing, for he produces his workers for the honey flow at the time the bees are most willing to co-operate. This is the condition present in most localities where comb honey is produced on a commercial scale.

In the northern States where the heavy brood-rearing period comes in April and May, normal colonies reach their peak in brood-rearing the latter part of May or early in June. In this region colonies that are normal as to number and vitality of the workers and have a good queen early in April can be depended upon to build up to rousing strength within two months to be ready for the honey flow early in June, provided there is nothing to hinder them from following their natural instincts as to brood-rearing at this time. Too often, however, something happens to prevent the bees from developing their greatest strength at this time. If egg-laying should be stopped entirely for a single day when the queen is laying at full capacity, the number of workers that will be ready for the honey flow is reduced by just that much. In some cases the eggs laid by the queen in a single day will result in a half pound of young bees three weeks later. It is, therefore, extremely important that nothing shall be permitted to interfere with brood-rearing at this critical time.

During the first half of the building-up period it is better if the bees do not crowd brood-rearing too much. The cool weather and stormy days of April may be a decided advantage in this respect, for when the main honey flow comes in June it is better for the heaviest brood-rearing to be done in May. Remembering that the bees are more than willing to do their utmost in brood-rearing in the spring, especially in the North, the beekeeper needs only to see that the bees are not hindered in carrying out their own program in their own way. Stimulative feeding and spreading brood should not be practiced during April in the North. These, if done at all, should be done some time in May when brood-rearing should be heaviest.

Spring Protection.

Colonies that have been wintered outside should be left packed until the middle of May or later, if this can be done without too much trouble. Colonies that were wintered in the cellar should be well protected from wind and the covers should be left sealed down during early spring unless it becomes necessary to open the hive. Colonies may be examined without removing the cover, by looking in from below. In some locations beekeepers find that it pays to pack the bees after they are taken out of the cellar, tho in most cases this is not done.

Room for Brood-Rearing.

In order that the bees may rear the great army of workers for the honey flow there must be sufficient room in the combs for the greatest amount that the colony can produce, which in the North may be 60,000 to 70,000 cells in the best colonies. While this number might all be crowded into 10 or 11 standard combs, it is usually spread over more.

For this reason the combs should be as nearly perfect as possible, for imperfect comb in the brood frames not only reduce their capacity for brood-rearing, but they also stand in the way of the rapid expansion of the brood nest in the spring. If a comb which is not suitable for brood-rearing is between the comb on which the queen is working and the other combs beyond, this imperfect comb stands as a barrier to progress in brood-rearing. Drone comb in the lower corners of the brood frames and comb that is too badly stretched to be used for worker brood in its upper portion greatly reduce the capacity for worker brood, and when two stories of such combs are used to supply sufficient room for brood-rearing, this imperfect comb near the top-bar stands as a barrier to the free expansion of the brood nest thru the two stories.

Stores for Spring Brood-Rearing.

Most colonies that are normal in April but which fail to develop their full strength before the honey flow in June, fail because of a lack of stores. One of the hardest things for beekeepers to learn is the surprisingly large amount of stores needed for the colony to rear the large force of workers required to gather the crop of honey. During the latter half of the building-up period the amount of brood is increased with astonishing rapidity, provided the bees have sufficient food to convert into young bees. When there is no opportunity to gather nectar from the fields at this time on account of cold or wet weather the stores of honey within the hives disappear rapidly; but, if the reserve supply runs low, brood-rearing is reduced to a degree that is ruinous at the very time that the ''harvest hands'' are being reared.

In the clover region there is an old saying among beekeepers something like this: ''If the bees do well on the early flowers and fruit bloom, there will be a good crop of honey in June.'' This old saying implies some mystic relation between the two, by which it is possible to predict what the honey crop will be by noting how well the early flowers yield. This relation is no longer a mysterious one; for the up-to-date beekeeper, by supplying the deficiency in stores when the early flowers fail, is still able to produce a crop of honey as he thus furnishes the food which is necessary to produce the workers that gather the crop.

An Automatic Feeder.

During the month of May in many of the northern States, and during April or earlier farther south, most of the brood which is destined to make the ''harvest hands'' is being reared. Whether the food used in rearing them is being brought in from the fields or is being supplied by the beekeeper thru feeders or is stored in the hive, the amount must be sufficient if the colony is to attain full strength in time. One of the easiest ways to insure this is to give each colony a second story of combs which are about two-thirds filled with honey. This second story becomes an automatic feeder, feeding the bees only as food is needed; and, in many localities at least, such a feeder, in addition to being automatic in its action after being filled the first time, is usually refilled each season without cost because of the better condition of the colonies thus abundantly supplied with stores.

FROM THE FIELD OF EXPERIENCE

REPELLENT IN SPRAY

How to Prevent the Poisoning of Bees by Arsenate of Lead Spray

On June 20, 1920, an apple orchard adjoining my apiary was sprayed in an attempt to prevent further damage by the gypsy moth caterpillars, which had come swarming out of the near-by wood and were not only attacking the foliage but also the young apples. The next day I found quantities of dead and dying bees about my hives. The bees were crawling on and thru the grass, making futile attempts to lift themselves on their wings. Many of the alighting-boards were spotted as with dysentery, and the bees' bodies when pressed by accident seemed to contain the same unpleasant-smelling matter. At first I thought of paralysis or Isle of Wight disease, but soon connected the spraying with the death of the bees and feel not the slightest doubt that it is a plain case of poisoning. It is a question where the bees got the poison—whether from the sprayed foliage (of course the blossoms had long since gone by), from a poisoned drinking place, or from a scanty growth of alsike clover under the trees. I was unable to determine the source from personal observation, but it must have been from one of these three.

Beekeepers in certain sections of New England have sustained severe losses from poisoning. I wrote to the Bureau of Entomology, Washington, and the experiment station of the Massachusetts Agricultural College to see if they knew of any repellent which would make arsenical sprays unattractive to bees, but they could give me no help on the subject and knew of no such repellent. So, when I heard of a repellent which has been and is at present being used with great satisfaction thruout the city of Newton, Mass., it seemed to me that its use should be more generally known.

A few years ago the city forester of Newton, at the request of a prominent beekeeper, F. S. Gourley of Waban (a part of Newton), agreed to use milkol as a repellent. Mr. Gourley had lost all his bees by poisoning at spraying time the year before, and had, after consultation with chemical and other scientific friends, finally hit on milkol as a cheap and good repellent. It has been used ever since with very good results. Practically the entire city is sprayed every year and bees are kept successfully.

Milkol is an ordinary disinfectant, somewhat similar to sulpho naphthol or carbonol. One pint of milkol is used to 100 gallons of the regular arsenate of lead spray. Foresters are, as a rule, afraid to use anything of this kind, fearing it will lessen the adhesiveness of their spray. The city forester of Newton has stated that, in his opinion, milkol not only does not lessen the adhesiveness but has quite the reverse effect—it increases the adhesiveness of the spray and is therefore quite a desirable addition.

Josephine Morse.

South Lancaster, Mass.

* * *

ESSENTIALS OF PRODUCTION

The Importance of Having Colonies Strong at Just the Right Time

When you failed to secure a crop of honey did you stop to consider why, or did you just charge it up to "bad luck," as so many are prone to do? Do you realize that two chances to one, your failure was due to your own fault, and not to that of the bees, or even the fault of that much abused personage called "bad luck"? It might pay us to analyze the situation, and see what things we did, or did not do, to contribute to that failure.

There are a few things that are necessary to success in honey production, things which may be termed essentials, and, contrary to the general opinion, these may be reduced to a very small number—in actual practice, to only three factors: First, a location where there is available an abundant source of nectar; second, a hive which has plenty of room, both for storage and brood-rearing; and third, a good, strong colony of bees.

The first of these essentials, that of location, or nectar supply, is partly beyond the control of the beekeeper, as it may be affected by the weather, or by the destruction of the nectar-bearing flora. However, it is often possible to improve a location very materially by growing such honey plants as the clovers, etc. On the other hand, the bees may be moved, in many instances, to another location where there is a dependable source of nectar.

The size of the hive will depend somewhat on locality; but, during the honey flow should be of sufficient capacity to contain all of the nectar brought in, as well as room for brood and bees, for if the colony ever becomes crowded for lack of room, the honey crop wil suffer more or less. During a heavy honey flow the green nectar will require much more room than is necessary for the ripened honey, and so supers should be added to take care of this.

Now as to the third essential. What we refer to as a strong colony should contain at the beginning of the main honey flow, from 10 to 20 pounds of bees; or, in other words, from 50,000 to 100,000 worker bees, besides a prolific queen, and brood in all stages.

How shall we secure such colonies? Again we have three essential factors, namely: A colony that has wintered well; plenty of food for the rearing of brood (either honey, syrup, or nectar, and pollen); and, in the third place, a brood-chamber large enough to accommodate a prolific queen. I am convinced that most of the hives in use have a brood-chamber that is entirely too small, resulting in the checking of brood-rearing, crowding of the brood-nest, and consequent swarming. Even the ten-frame Langstroth hive-body in common use is too small for a good queen; and we can get a much greater amount of brood reared by the use of a larger brood-chamber, either one with larger frames, or more of them in the hive, or else by allowing the queen the use of two stories of combs during the period of greatest brood-rearing in the spring.

Corner of apiary of J. M. Buchanan. Strong colonies are the ones that store the honey.

It is important that the colony should have wintered well and come up to the period of spring brood-rearing with bees that have not wasted their vitality to a large extent in the attempt to keep up the temperature of the cluster during the rigors of winter. In order that a colony should winter properly and come thru in the best condition for building up, we find that once again, there are three essentials, which are sufficient stores, adequate protection, and plenty of young bees at the beginning of winter. There should be at least 25 pounds of honey per colony, and more would be better, for if it is not needed it will not be wasted.

As to what constitutes adequate protection, that is a matter of locality and climate, and must be worked out to suit individual cases. If the bees are wintered out-of-doors, we can hardly emphasize too strongly the value of some kind of windbreak, wherever freezing temperature occurs at any time during the winter months.

For good wintering, it has been demonstrated that there should be as many as three pounds of young bees in each colony when brood-rearing ceases in the fall, and where there is a late honey flow the bees will generally attend to that themselves. But if there is no honey coming in during the autumn months, the beekeeper should resort to stimulative feeding to secure late brood-rearing. A few ounces of thin syrup given every day or two for a month will give good results.

It is not my purpose at this time to go further into the details of methods of manipulation, styles of hives, equipment, etc., as these are all relative matters, which will necessarily vary with different persons, localities, and nectar sources; and the individual beekeeper must adapt them to his own conditions to the best of his ability, always keeping in mind the fact that, if the essentials are present, success will be attained. J. M. Buchanan.

Franklin, Tenn.

FINDING QUEENS

An Easy Way to Find the Excitable Kind

After having had considerable trouble in finding the queens, especially ''blacks'' and having sometimes opened a hive three different times and spent an hour in the search without finding the queen, it occurred to me that an excluder could be used to advantage. I proceeded as follows: If a super is on the hive, this is removed and set on an empty hive-body, the excluder is placed on top of the super, and another empty hive-body placed on top of this. Then the brood-frames are taken out of the hive and the bees shaken into the empty hive-body above the excluder when they generally pass down thru the excluder into the super at once. If they are slow in starting, a little smoke will send them down. Unless I happen to see the queen before, I do not look for her until all the frames have been shaken and the workers are about all thru the excluder, when she will generally be seen at once among the drones. If she is not found then, the few bees on the bottom-board and on the sides of the brood-chamber are shaken and she will be found as soon as these have passed thru the excluder. If there is no super on the hive, the bees on two frames of brood are shaken into the brood-chamber, these frames of brood placed in an empty hive-body, the excluder on top of this body and the other empty hive-body over the excluder, then the bees are shaken into the upper hive-body as when the super is used.

Pomfret, Vt. Carl C. Johnson.

SIFTINGS

J. E. Crane

THE weather has been mild in New England, as thru most of the United States, during the past three months, with little snow, yet with the ground covered with snow enough to protect clover most of the time.

* * *

Mr. Bedell writes me that after the cappings from 1,000 pounds of extracted honey have stood and drained for 24 hours he can press out from 30 to 40 pounds honey "in the very best marketable condition," leaving a cheese 15 inches in diameter and 4½ inches thick.

* * *

On page 146, H. F. Wilson lays down a good, solid foundation for building up strong colonies for the honey harvest. First, by protection from the wind. Second, by packing the brood-chambers to keep them warm. Third, by giving them lots of honey and then more honey. Good advice.

* * *

Allen Latham's hypothesis of the cause of the 'washboard action of bees" is certainly ingenious. (See page 152.) With his theory to start with and thousands of watchful beekeepers studying the same subject, we may in time be able to prove this theory correct. How much there is about bees yet that we don't positively know!

* * *

Page 160, ah, ha! Mr. Parks, your bees down in Texas working all thru January on fruit bloom! Why, we here in New England keep such dainty bee forage until May or June. It seems positively wicked to keep your bees at work the year round. We give them a rest from September till April, but we find it pretty hard keeping the little fellows quiet. Yesterday (March 1) we found some hives with as much as a whole Langstroth frame full of brood.

* * *

L. L. Andrews, on page 159, offers some sensible advice in view of low prices. He says: "There is no cause for any great anxiety in the matter. Prepare for a crop and produce it just as economically as you can consistently with the general conditions. The writer has sold honey in times past at a figure really below the cost of production, if an honest labor and expense charge were made. But with present methods of marketing, it is not likely we shall be called upon to do it again."

* * *

In the January issue of Gleanings Mr. Holtermann writes of his success with a wax press for separating honey from capping when extracting. In the February issue I suggested that it would be very interesting to know just what per cent of honey remained in the pressed cappings. Now comes Fred P. Jansen, on page 169, and states that he has used a press of his own construction and has found the average amount of honey remaining to be 50 per cent of the pressed cappings, sometimes a little more, and sometimes a little less.

* * *

I have often wondered how bees managed to rear their brood while their wax organs were being developed, if the theory of some naturalists is true that bees that build their combs of woody fiber and those that build their combs with wax come from the same ancestral source. A statement by W. B. Schrels, on page 147, would seem to throw considerable light on this subject. In speaking of the native bees of Costa Rica he says: "Some build wax combs; others, half wax and part woody fiber; still others build all fiber nests, something like a wasp's or hornet's nest."

* * *

Early in February I received from O. W. Bedell a small sample of pressed cappings. He wrote me the sample was hardly a fair one, as it was two or three years old, but all he had. He desired me to test it and find out the per cent of honey it contained. It appeared quite dry and gave little evidence of honey; but, on melting it in water, I found 41 per cent to be honey and 58 per cent wax and sediment. So I think we may safely conclude that from 40 to 50 per cent of these pressed wax cakes or cheeses is honey. This does not condemn the wax press by any means, but only shows that it will pay to melt the wax cakes when we have the leisure and save what honey remains.

* * *

Formerly the great burden of our bee journals was how to produce more and more honey; but of late the thought of selling is looming up as a big part of the business, with the idea of selling near home and by advertising. Mr. Aeppler, on page 153, March Gleanings, tells how he disposed of his 10,000 pounds to good advantage in a retail way by advertising; and C. A. Burch of Indiana, page 162, tells how he disposed of his crop in the same way. There is no question but that large quantities of honey could be sold if people only knew where to get it. We have recently had orders for honey from the middle West and even the southern States, to be sent by mail. I feel sure people would not send so far for honey if they knew it could be obtained near them.

AMONG CALIFORNIA BEEKEEPERS

CONSTANCE ROOT BOYDEN
(Stancy Puerden)

DID you ever know a woman to accept an invitation to share in a four weeks' trip, with just one hour and 40 minutes in which to prepare for it? Take my advice and don't risk such an invitation unless you mean it, for my nearest man-relative tried it, and now he is paying for my traveling and hotel expenses. In other words, much to my own surprise, this page is being written beside an open window, thru which the soft California air is pouring, instead of in a steam-heated room back in Ohio. Altho there were dozens of reasons why I should stay at home, I temporarily forgot everything except that the husband I have had for 23 years was going to the beautiful State which I adopted a year ago, and I wanted to be with the former in the latter.

Some of my friends laugh at my enthusiasm for the Golden State, and returning tourists have even professed not to like its climate or scenery. Everyone to his taste, but it is my candid opinion that a person who can find fault with California at this time of year will point out defects in Heaven if he ever gets thru the pearly gates.

At the start I had rather regretted that we were not going by one of the southern routes, but for delightful contrast nothing could excel the route we took to San Francisco. We had ridden for days thru country which showed no signs of spring, the last day thru treeless desert plains, rimmed by great, barren mountains, some of them covered with snow, their only beauty lent them by the brilliantly clear air and the dazzling blue sky, the reflection of which in the desert parts made the country "The land of the sky-blue water."

At night we climbed the mountain range out of Nevada into California, went thru the 21 miles of snowsheds with moonlight glimpses of great, snowy peaks thru the breaks in the sheds, and when morning came we were dropping down the west slope of the range into springtime in Paradise.

In contrast with the dull gray brown sage of the winter desert the grass was everywhere a velvety green, and after seeing scarcely a tree for days the magnificent trees dotting the landscape were a beautiful surprise. And oh, the wonderful orchards of fruit bloom, mostly apricot, I believe, altho they looked much like peach trees to me. Even high up on the green foothills were orchards covered with those soft pink blossoms.

Gardens and fields under cultivation, sheep and cattle on the green hills, picturesque mountains in the background, fertile valleys, woodsy canyons, bird music, palms, orange trees and flowers, flowers everywhere, combine with the perfect climate to make one understand how Adam and Eve must have felt when driven out of a similar Paradise.

WHAT started my traveling companion to California at this particular time was the thirty-second annual meeting of the California State Beekeepers' Association, held in Oakland March 2, 3, 4, and 5. Its sessions are being held in the fine large municipal auditorium across the boulevard from beautiful Lake Merritt.

Westerners certainly know how to do things of this sort. In the first place they persuaded the governor of the State to issue a proclamation that this was honey week for the whole State, and calling upon all the citizens to eat honey this week. In every street-car in the city is a large placard, "Eat Honey."

The city provided an ideal place for the meeting with ample free space for exhibits, the mayor gave an address of welcome, and plenty of able speakers seem available. I imagine a very large part of the credit is due to the enthusiasm and energy of Cary W. Hartman, president of the Alameda Beekeepers' Association. He makes an ideal host.

Just as we were leaving the Hotel Oakland to attend one of the sessions an incident occurred which is so typical of the West that I am going to take space to tell it. In the doorway we met a party of four or five fine-appearing men. One of them stepped up to Mr. Boyden, shook hands cordially, and said, "How do you do, sir. I am nobody in particular, but I just wanted to shake hands and bid you welcome to our city." He had noticed the yellow ribbon badge of the State Beekeepers' Association, which Mr. Boyden wore.

Now I have no intention of attempting to give a report of this beekeepers' meeting, but I am going to tell you a little about an address by C. H. McCharles, chemist for the State Food and Drug Laboratory of the University of California. He was to talk on "Composition of Honey, detection of adulteration and effect on honey of overheating and other bad things in the care of the product. Also difference in composition as influencing granulation"—some subject.

Prof. McCharles, with the aid of charts, told us something of the chemical composition of the various sugars, including those in honey. I think he stated that his figures were based on government bulletin reports, but he put the water content of honey rather higher than generally stated.

In the course of his remarks it developed that he believed the food value of honey to be no greater than any other sweet of the same calory value, that the ash content had absolutely no value, that honey was no easier to digest than any other sweet, that honey should be considered a delicacy rather than an important food, that he could see no reason why corn syrup should not be mixed with honey if it were so labeled, that it might even be an advantage in preventing granulation, that he did not know whether or not there were vitamines in honey.

At this point a young man arose and announced with an air of finality, "There are no vitamines in honey," and went on to cite the report of the feeding experiments of R. Adams Dutcher, which proved that the amount of water soluble vitamine was negligible in honey.

I nearly burst a blood vessel just then. You see, altho I adopted California after my visit here a year ago, it has never adopted me; and, therefore, I had no right to speak in a California beekeepers' meeting, even if brave enough to attempt it.

However, after the meeting I had a pleasant talk with Prof. McCharles, and came to the conclusion that he did not mean quite all he said, that he thought honey producers were a bit chesty over their product and enjoyed shocking them. I imagine, anyway, he is slightly cynical about the need of more vitamines and soluble mineral salts in the modern diet.

MANY people have the delusion that a person who can write a little can also speak in public, and the committee therefore invited me to talk on Friday evening. Of course my subject was "Vitamines in Honey;" and I am going to say right here that if my brother, E. R. Root, finds many such friendly, appreciative, and intelligent audiences I don't wonder he has formed the habit of speaking at beekeepers' meetings. One of the first to come to me and introduce himself, after the meeting was over, was the young man who had announced in an earlier session that there are no vitamines in honey.

He is a professor of chemistry, physiological chemistry, I think, in the University of California, and his name is Clark. He seems keenly interested in bee culture as well as chemistry, just the sort of man who can be invaluable to the industry. He said he was familiar with the research work of Philip B. Hawk as well as that of Dutcher; but, believing that the fat soluble content of comb honey is the wax, he felt justified in saying there is none in honey, and he spoke with that air of finality because it was his classroom manner. It is funny now, but it spoiled the better part of a night's sleep for me at the time.

One can always learn something valuable in talking with such a man. Here is a point he brought out: When excessive amounts of honey are eaten laboratory tests show that the system is unable to make use of it and the kidneys eliminate it. I have always felt that there is danger in urging people to eat honey in large amounts at a time. The best of foods should be used in moderation.

Let me add that Prof. Clark by no means shares the views expressed by Prof. McCharles concerning the food value of honey, its digestibility as compared with sugar syrups, etc. And you and I know that many eminent chemists and nutrition experts have also endorsed honey as an easily assimilated sweet of high food value.

THERE were a number of enthusiastic women attending the beekeepers' meetings in spite of the fact that I was told there are comparatively few women beekeepers in the State, that honey producing is now largely in the hands of specialists who do it on a large scale. Some of these women apparently were successful amateurs, and some were efficient partners of their beekeeping husbands. One of the latter (Mrs. Stuart) being unable to appear in person on the program, sent her paper on "The Uses of Honey in the Home." It told many of her experiences in retailing honey from her home and was very interesting, humorous, and valuable. When I heard it read I said to myself, "Stancy P., here is where you take a back seat;" for she uses honey in her household to an extent I have never dreamed of doing, and am afraid never shall, as neither my family nor myself like honey combined with certain fruits and flavors. I believe Mrs. Stuart stated that she bought no sugar whatever for household use.

She wrote about sunshine preserving with honey. Doesn't that sound appetizing and so appropriate? Her instructions were to use a pound of honey for every pound of fruit, mix them, spread on platters, put the platters in a box slightly higher at the back than the front, cover with glass, and place in the sunshine on a bench or chair with its legs in water to prevent the entrance of ants. Small fruits could be preserved whole, but large fruits should be cut in convenient pieces for serving. When the preserves are thick they should be put into sterilized jars and sealed or covered with melted paraffin.

Sunshine preserving is doubtless easier to do in California than the East, but I am surely going to try some honey sunshine preserves next summer.

ASIDE from the meetings in the auditorium the visiting beekeepers were royally entertained by the Alameda Beekeepers' Association. Automobiles, including the mayor's official car, were at our disposal for rides thru the various Bay cities. We were taken to the University of California and escorted about its beautiful campus and thru many of its departments, and finally we were entertained at luncheon in the Hotel Oakland, in honor of the president, J. E. Pleasants, and the members of the State Association. Mr. Pleasants, by the

(Continued on page 243.)

Beekeeping as a Side Line

Grace Allen

LIFE'S years are filled with wonderful beginning-times. There are the New Years' Days themselves, like wide gates opening into fresh fields, inspiring first days of months, radiant first days of weeks, and every day of them all with its own miracle-working morning. But of all beginning-times, Nature's own favorite is surely the spring. To what great tasks does she then set her mighty invisible hands!

Happily, the spring season is not only the most pleasant time to begin keeping bees, it is also the most practical; particularly if the new beekeeper be wise enough to have read widely on the subject during the preceding winter, so that he may know something of what to expect and a little of what to do. Then when he first opens his newly acquired hive, when plum trees are like fountains of white beauty and peach trees are all a sudden blush, how much more intelligent will be this first rapturous look at the marvels therein. Moreover, he will know how to go about it all. He will have acquired a smoker and a hive-tool and a veil. And as some tremulous day nears the noon hour, when he knows from his reading that many bees will be out in the field, thus making an examination of the hive easier and more pleasant, he will light his smoker and put on his veil, puff a whiff of smoke in the entrance, and with his hive-tool gently remove the cover. Carefully he will separate the combs, pushing part of them close against one another to leave room to lift one out, slowly and quietly, that the bees shall not be crushed or irritated. And there he will find just what his books told him he would find.

For, made wise by his reading, he will have been particular to buy at least his first colony in a modern movable-comb hive. These hives are very simple and easy to operate. The beekeeper buys them all ready to be put together, every part cut to the most carefully accurate dimensions, and finds much of his pleasure in the assembling and nailing of them. Everything is movable. There are separate bottom-boards and covers and hive-bodies. The beekeeper provides himself with extra hive-bodies, either full-depth or shallow, so that he can raise the hive cover, at any time, and put on one of these extra bodies, which forthwith becomes a "super." Thus he adds to the capacity of his hive. Inside each of these chambers hang frames, usually ten, that hold the combs. When new, each frame is given a "full sheet of foundation," a thin sheet of beeswax, stamped with the impress of the hexagonal cells of the honeybee and cut to the right size. On that sheet of wax foundation the bees build the comb straight and perfect, with cells of the size most valuable to beekeepers.

Outside of flowers, there are few things so delicately beautiful as newly built honeycomb. And the mystery of its making is as baffling. We may explain as learnedly as we will, or as we can, cells and glands, protoplasm and metabolism, chemical changes and vital processes. When the best informed of all the human race has exhausted the subject, he can not make one cell of honeycomb nor one tiny particle of wax. The most becoming thing he can do is to yield it his most generous and ardent admiration, letting the marvel of it and the beauty of it thrill to his very fingertips, as he looks at its waxen wonder, so fragile, so fragrant, and so clean. This is while it is new. With the years it grows stronger, tougher, darker, less like a thing fashioned by fairies.

Yet this fairy-like new comb, built by young bees in the dusk of the hive, this thing of mystery and translucent beauty, was made for definite practical use, for two supreme purposes—yea, even three.

In those waxen cells the bees store the nectar. Fitting urns, indeed, they are for this marvelous gift of liquid fragrance and light borne by silken wings from the cups of sun-blessed flowers. Spread out in these thousands of six-sided vats, the thin nectar is gradually evaporated, slowly and steadily transformed into rich, ripe honey. The mouths of the urns are then sealed over as with white silver and the comb has become the inviolable vault for the priceless treasure of the hive. Thus it fulfills one great end of its intended destiny.

In other of these cells are packed the many-colored pollens, gay rainbow-like dust from the hearts of the flowers. This is a lesser usage for the comb, yet a very important one, as pollen is a vitally essential food for bees, being required in especially large quantities during the period of heavy "brood-rearing" while thousands of larvae are making their rapid growth.

The other great purpose of the comb is to cradle the young. A certain part, somewhat like a carelessly curved sphere, is set apart in the inmost center of the hive as a nursery. Here in cell after cell tiny eggs are deposited, wee ivory specks that contain the unbelievable promise of future eyes and legs, gauzy wings and strange incomprehensible instincts. The egg hatches into a diminutive helpless larva that cannot leave its cell, a wee white baby worm that curls up in its cradle, is fed constantly and generously and does nothing but grow. Until, behold, the time quickly comes when it nearly fills its cell, whereupon the bees cover it over as with a brown blanket, and leave it in darkness and warm close silence to finish its development. And when some later day it cuts its way out into the crowded restless life of the hive, it is a bee like other bees, head and thorax and abdomen, legs, antennae, wondrous wings.

In the spring, at the time that our beginner is taking his first breathless look inside a hive, the colony may consist of 10,000 bees more or less, probably more. The long winter has seriously reduced its numbers, and now all efforts of the bees and the beekeeper alike must tend towards bringing it up to its normal summer population of 60,000 to 70,000 or more. But one amazing thing is that all the bees in the hive in early spring are females—one alone wonderfully and significantly different, the rest all alike.

Indeed at any season of the year, however large the population of the hive, the great overwhelming majority of them are peculiarly developed females, quite properly known as ''workers.'' The future of the race depends upon their labor, but not at all upon them themselves, in any reproductive sense; for they do not mother it. They are unable to mate and normally lay no eggs. But everything else that is done in this strange bee home, is done by these unresting workers. They feed the ever-hungry larvae; they keep the hive clean; they stand at the entrance as sentinels, challenging each incoming bee and forbidding the way to enemies; concealed in the ends of their bodies are sheathed weapons like poisoned darts, with which they defend the precious home with its babies and its treasure, often yielding their lives in the act; with incessant beatings of their wings they ventilate the hive by driving constant currents of air thru it. It is the workers who make the wonderful wax for the combs, hanging dense and still while drop by drop exudes from the wax-glands on the lower sides of their bodies, hardening as it strikes the air. It is the workers who flash across the light on tireless wings, who with their long tongues reach the nectar in the flowers, bring it to the hive in special honey-stomachs, ripen it in innumerable urns, and seal it with the sacred seal. It is the workers who collect the pollen, carrying it home in great balls on their legs, as tho in saddle bags. It is the workers who bring in water and who gather strange tree gums, known to beekeepers as propolis, to smooth over rough places in the hive or to glue up cracks (even those the beekeeper doesn't want glued up!). And it is the workers who give of themselves so freely, with such a spendthrift generosity, that in the height of their working season they seldom live more than six weeks. Six weeks of tireless devotion in the sweet-smelling shadowy hive, and of dauntless flight on swift frail wings thru sunlight to distant flowers—and they are gone—faithful wings ragged and worn. Six weeks of song, blended of eagerness and content—and they are silent, forever.

The one strangely different individual (in the spring the only bee in the hive besides the thousands of workers) is also a female, yet utterly different from the workers. Her long beautiful body contains the hope of the race, for she and she alone, in each hive, is the mother of all the rest. Beekeepers, more happily than logically, call her ''queen.'' Tho she by no means rules the hive, yet the circled retinue of workers always around her and their apparently tender care of her make the term gracefully appropriate. She performs none of their tasks, lacking the physical equipment for honey-gathering and pollen-bearing and wax-secretion. When a queen is about a week old, she makes one dizzy nuptial flight up, up, up into the glory of sunlit spaces. Then mated and matronly, she settles quietly down to her appointed destiny of egg-laying In cell after cell she deposits the ivory-white eggs, until thousands and thousands of bees have emerged, while thousands of others lie in their covered cells, or in open ones, still being fed; and still she lays on. Sometimes at the height of her laying period she may lay two or three thousand eggs a day. But never again, unless in company with some future swarm, will she know the rapture of wings and sunshine. In the dusky hive, she may live several years, while her multitudinous families of shorter-lived sun-loving children flit thru their little day and disappear.

One of the wonders of the queen, too, is that some of these very same eggs that develop into unnumbered workers may, merely by the use of a larger cell and a difference in the feeding during the larval stage, be developed into other queens, who, mating, become themselves mothers of teeming hives. And another wonder is that in later spring and summer the queen lays, in addition to these female-producing eggs (and in far lesser number), eggs that produce males.

Male bees are known as ''drones.'' They do no work at all. They don't even defend the hive. They are made that way, tho; they haven't even a sting. They are big-bodied—coarse-looking—heavy feeders. They have immense eyes that meet on top of their heads and strong powerful wings. The drone exists for one purpose only; in the act of achieving this by mating with a young queen in mid-air, he dies. Unless restrained by a wise beekeeper, every hive produces these honey-consuming undesirables with a strangely unnecessary prodigality. Then, as the honey flow declines, they are relentlessly disposed of. The workers attack them bodily or drive them from the hive or refuse them entrance when they come swaggering back, gay and carefree, from some romp in the summer sun. Thus perish the drones.

FROM NORTH, EAST, WEST AND SOUTH

In Southern California.—The California beekeepers have one more crop to market thru the Exchange under the present contract. When the new contracts are written up, there is every reason to believe that there will be many improved features. For instance, the the beeswax pool at present contains all of wax for the year. Many of us think that there should be two or more pools, making it unnecessary to wait a whole year for the final returns, if one puts wax into the warehouse in January or early in the season. To show the increasing popularity of co-operative marketing, when the California marketing act went into effect, there were but five marketing organizations. In 1919 there were 35.

The orange growers are inclined to leave the fruit on the trees as long as possible this season, owing to the low prices and the poor market conditions in general. Just what effect this will have on the buds and blossoms, it is impossible to tell at the present time. A tree, with an abundance of moisture surrounding the roots, blooms much more freely and the bloom stays on much longer than where the ground is somewhat dry. As long as the fruit remains on, it is sure to take considerable substance from the tree. We can hardly expect the average of the past three years to be kept up in the orange honey flow, as we have been exceptionally well favored.

The bees are in a fairly good condition. Perhaps they are a little short of stores in some of the apiaries; but, with good weather conditions from now on, most of the ranges will furnish a living for the average colony. Disease is well under control, and only occasionally an apiary is found where it is at all bad. European foul brood crops out at times, and it will be well to keep a close lookout for this enemy until summer. It comes on very rapidly at times and often does much damage before it is discovered.

Prof. Ralph Benton, of the faculty of the California State University at Berkeley, gave a very interesting talk before the beekeepers of Riverside County recently. He said that co-operation today is a movement toward success along all lines of production. Publicity is all right, but the industry must be built up by lowering the cost of production. The dairymen found out by careful tests that their profit was all coming from 50 per cent of their herds, the other 50 per cent being kept at a loss or barely paying expenses. Mr. Benton said that he often wondered if our profits do not come from 40 per cent of our colonies. There is no doubt but that great improvement can be made by the proper selection of stock and by paying closer attention to detail work.

A range is often crowded because one man has made a success on it; when, if the facts were known, it is the beekeeper and not the range at all. The beekeepers of Orange County have a department of the Farm Bureau whose duty it is properly to locate apiaries and to adjust locations in and near the oranges. There is a great chance for co-operation and education in getting ready for the orange flow.

Beekeepers should keep records in order to know what it is costing them to produce honey. When our committee was asking for tariff protection on honey, they were asked, "What does it cost to produce honey in these United States?" And no one could answer. Can you? We will venture to say that not 10 per cent of the beekeepers in the United States can answer the question with anything more than a guess. One man paid $1200 for moving his apiaries and made $1300 worth of honey. Did it pay?

There are 5640 students taking the various agricultural correspondence courses of the State University extension work. Last year only 300 students were taking beekeeping—not a very large per cent.

J. D. Bixby in the Honey Producers' Co-operator says, "A careful survey of the Covina citrus district, the first week in February, failed to find a single available bee location more than one-half mile from a large commercial apiary already located." This includes a large territory.

Corona, Calif. L. L. Andrews.

* * *

In Texas. February has been adverse to the best development of the honey plants. Eastern and north central Texas have received a normal amount of rain and there the conditions are normal. The rest of the honey-producing area has been too dry. Horsemint has suffered so that it is doubtful if there will be much horsemint honey this year. A frost the latter part of the month injured the agarita somewhat. The rain coming at the end of February gives hope for a good honey flow from spring annuals. Everything indicates a honey flow from mesquite. All things considered, the prospects for a honey crop are good, but one equal to last year cannot be expected.

With the Biological Survey and the various farm organizations calling attention to the absolute necessity of fighting rats and mice, we again have to report the work of the rats on the honey plants in the Southwest. There is an area extending from Uvalde to Crystal City in which very conservative beekeepers estimate that from 2/3 to 9/10 of the huajillo and catsclaw has been killed by the rats peeling the bark from the brushes. These same men have given up hope of a honey flow from this source. The mesquite, however, was not attacked. It is suggested that the residents in that district get in touch with the Biological

FROM NORTH, EAST, WEST AND SOUTH

Survey at Washington and by their aid start a campaign against the rats.

All beekeepers of Texas who expect to ship package bees or queens are warned that many northern States have quarantine laws, and some of these States have announced that no bees without proper inspection certificate can enter their borders. As Texas provides free inspection, take no chance, apply to Dr. M. C. Tanquary, College Station, Tex., for inspection, stating that you expect to ship bees.

Every little while someone discovers a new cause for foul brood. Texas has had her quota of these, but California has a new one. A well-known beekeeper writes in the Western Honey Bee that he has discovered that the organism which causes the foul brood, lives in the pollen of willows and like plants; it attacks man and gives him hay fever, causes all adult disease of bees and European and American foul brood in bee larvae. If this be so, it is useless to fight bee disease. Texas has enough faith in what she has accomplished to go ahead on the old line and not worry about this new explanation.

The Beekeepers' Short Course at A. & M. College, College Station, Tex., has been mentioned several times in these columns. The dates are July 25 and 31. The instructors will be from the professors of A. and M. College and the men from the experiment station. To aid these a number of the beekeepers of the State will give instruction along the lines in which they excel. A beeman of national reputation will give one or two addresses. Five hundred beekeepers are expected.

L. W. Watson, the new State apiarist, is on the job. He has visited the various experimental yards and is now outlining the work of his department. He is very much impressed with Texas problems and is going to solve some of them.

A large number of our disputes and controversies are due to a lack of specific information. A fine example is the case of the huisache. Many honey producers give this tree as a honey plant, and others are ready to defend their claim that a bee gets only pollen from it. This misunderstanding comes from the fact that growing in the same localities from the Edwards Escarpment to Mexico, there are two plants very similar in appearance and size, having flowers of nearly the same color and shape, but one is nectar-bearing and the other is not. **Acacia farnesiana** Willd. (huisache) is seldom, if ever, a honey plant, while **Acacia tortuosa** Willd. (huisachillo) is a good yielder of nectar. The latter, however, does not occur in such numbers as the huisache.

San Antonio, Tex. H. B. Parks.

In Iowa.—We have just taken a peep at the bees in the cellar, and from all appearances they are wintering finely. They are very quiet, and the mortality is, if anything, less than usual at this time of year. From present conditions, we shall be very much surprised, if they do not come out of the cellar in normal condition. In fact, if the weather continues the remainder of the winter as it has thus far, we expect the bees wintered outside to come thru in fairly good condition, provided they were supplied with plenty of good stores, as we have had no very cold weather and what little we have had has been for only a few days at a time. If the outside bees should winter well, it will undoubtedly give encouragement to young beekeepers to try it again, which would be taking long chances. Young Iowa beekeepers should not take this winter as a basis for future wintering. Many gray-haired men have never seen an Iowa winter as mild as this one, and it will probably be a long time before another rolls around; so better give your bees the proper protection than wish you had.

There is still plenty of honey in Iowa unsold, and the market is holding steady, but the demand is not heavy. With but few exceptions the beekeepers have kept their heads and not slashed prices, and it is well they did. While this holding the price steady may not allow us all to clean up the 1920 crop, it will go a long ways towards stabilizing prices for another year.

In a former article I stated that I doubted whether the slashing of prices would make any material difference in creating a demand. Since that time we have shaded our prices three times, and lately we have been offering fancy clover extracted at $12.00 per 60-pound can at the apiary, and $12.50 f. o. b.; yet we are selling no more honey than we did before we cut prices at all, so we have made up our mind just to "bide a wee."

While we have for the past 10 years sold nearly all our honey to the mail-order trade, we should like mighty well to see co-operative marketing come into vogue, and we would do all we could to help put it over in our State.

Conditions have changed very materially in the past two years as to this manner of selling honey. Excessive freight rates have done untold harm to our business. Naturally a trade of this kind takes honey in small shipments and must go at local freight rates. We have lots of customers to whom the freight in 200-pound lots adds 2c per pound to the price of the honey, and smaller lots proportionately higher. The price of containers is cutting into the profits or else adding to the price to the consumer. Shipping box lumber has doubled in price, and poorer quality at that. Our printing is quite an item for a small business, to say nothing of the labor required to take care of a lot of correspondence; and, unless conditions change, we do not expect to try to increase this trade.

The co-operative marketing would in many instances give the beekeeper a chance to have his cans and cases returned, which would be no small saving in handling a large crop. Carlot shipments would not be uncommon, and a big saving in freight would be the result. In many instances better distribution would result, which in itself would help wonderfully. In the meantime sell all you can locally. W. S. Pangburn.

Center Junction, Ia.

* * *

In Ontario.—There has not been a day this past winter that autos have not passed our doors. That, in a nutshell, gives an idea as to our snowfall for the season. And we have had very little rain, too; so precipitation has been away below normal for this part of the globe. Continued freezing by night and thawing by day are doing a great injury to clover, on some soils at least; and, needless to say, this does not improve prospects for the beekeeper. Some correspondents have reported heavy consumption of stores; one beekeeper today wrote me that bees in his locality were almost out of food already. I have hardly looked at a colony since last fall, as the older I get the more careless I become about winter "tinkering." If they are not all right in the winter, the mischief is already done; so what is the use of knowing about the loss too soon and worrying about it? Do your best in the fall and then cease worrying, no matter what happens in the winter, appears to be a good motto for a beekeeper. Needless to say, if disaster happens and the cause is apparent, then do your best to overcome that another fall; for little can be done in the winter, so far as bees are concerned.

In the last paragraph of my correspondence for March Gleanings an obvious error occurs. Speaking of the difficulties in sending bees by express, it should say that many have ceased sending by that method—in fact, some absolutely refuse to send package bees into Canada by express under any consideration.

Honey markets are still dull, and prices are at least as weak as they were a month ago. But the demand for bees is very brisk, as nearly every mail for the past week has had inquiry for colonies of bees—most of these inquiries being from beginners.

Bees thruout southern and central Ontario have had a cleansing flight in most localities. All reports to date say that about all colonies are alive. I have been in but two of our yards for weeks, and so far have not noticed any dead colonies. In fact, we have had no severe winter weather for any length of time, and, if bees had stores and were fairly well protected, I see no reason why they should die a year like this. But spring is young yet, and if stores have disappeared as some state, there is lots of time for fatalities during the next six weeks.

Experts say that the colder the weather the more bee activity, and hence more stores are used. Brood-rearing is also accelerated. Experience here in the North says that mild winters mean heavier consumption of stores than cold winters, if colonies are properly protected. Who is right? I venture to say that both opinions are in a measure correct, but the trouble is we are apt to get lopsided in our views and not consider questions like this from all angles. At any rate, I would rather have a fairly cold, even winter for successful wintering of bees than any other kind of climate that we can have served up to us here in Ontario.

A carload of sweet-clover seed was loaded at our station a few days ago, which was bought for $3.50 per bushel, if I have the matter right. No wonder that farmers with a big acreage of this plant seeded for this year, are debating as to what to do with it. As to their decision, it is needless to say that any hopes we have of another sweet-clover honey crop are all dependent upon what action they take in the next two months.

For the past few days my son Edwin and his "Dad" have been at the wax-rendering game. While the weather outside has not been very cold, in the room in which we have been working, tho we had no thermometer to vouch for it, we felt as though the temperature was somewhere around 125 degrees F. Working over a steaming boiler the humidity makes itself felt more than the mere heat, and we certainly have had a bleaching. We have fixed up over 1000 pounds of wax mostly from cappings, and while it is hot work, yet there is something about the job we do not dislike, provided it does not last too long.

For the cappings we have tried many plans, but have settled down to the single-cheese unheated press. For old combs, while we at one time condemned the hot-water press—known here in Ontario as the Sibbald press—at the present we would not use anything else for the job. At the first trial, some years ago, we did not know how to use it and made a mess of things; but, after "learning how" we pronounce the hot-water-surrounded press as the only real method for getting out nearly all the wax from old combs. Just the other day I met a friend who runs about 100 colonies who stated that he had never used a press of any kind. If anyone knew just how much wax was thrown away by some of the crude rendering outfits still in use, many wax presses would be bought at once. J. L. Byer.

Markham, Ont.

HEADS OF GRAIN FROM DIFFERENT FIELDS

Two Timely Hints. While diagnosing the condition of the colonies during the early part of the season from the flight of bees at the hive entrance any unusual observance, such as less activity in certain colonies while others are busy, indicates that something is wrong. On examining such a colony with plenty of bees and a good queen there will likely be found a large amount of mostly old brood, but a meager amount of stores left, causing the bees to be inactive and not inclined to leave the hive in search for nectar; while other colonies with plenty of stores are eager to obtain more, even when only a small amount of nectar and pollen can be gathered. Such colonies, if not given more stores, may eke out a bare existence by restricting brood-rearing. They will be far behind colonies that were well supplied. Moral—prevent such a condition by plenty of stores at all times.

While examining colonies for the purpose of ascertaining the amount of stores, clipping queens' wings, etc., in fact, for any purpose, it is well to keep watch for any imperfect or otherwise objectionable combs. If any such are found, they should be removed at once if free from brood or eggs. If they contain brood the top-bar should be marked, and later, when weather will permit, these combs should be moved to one side of the hive. The chances are they will soon be free from brood, after which they can be taken out of the hive. Every poor or imperfect comb replaced by a good one now means more bees for the honey flow. Sometimes a comb may be badly clogged with old pollen. Such combs should be removed, but remembering there must be some combs with considerable pollen for the colonies' welfare.

East Avenue, New York. A. C. Gilbert.

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Spreading Brood in Spring. It will soon be time to discuss spring management of bees, including the spreading of brood. This subject has been considerably discussed in different issues of Gleanings, and it appears to be a dangerous practice at times for the professional, and always for the novice.

Now my plan has always worked well for the last 10 years, and I can find no such fault with it as is often found in the others.

When looking over the hive in the spring see that the outside combs are filled with honey; note the position and number of combs of brood in the brood-nest, but do not disturb their order. There is this important point at this and each examination: See that the comb next to the brood (except the outside one) is empty. Just as soon as the weather will permit and there are bees enough to keep this comb warm the queen will lay in it, and you can then add another. There will be no chilling of brood and no scattering of the cluster. After 12 years of practice I have not discovered any drawbacks. If this method does not spread the brood, either the queen is poor or there are not enough bees. W. H. Miller.

Tivoli, N. Y.

* * *

Conditions Affecting Early Brood Rearing. It is unnecessary to point out the peculiar, yes, remarkable weather that we have been having in the clover-honey-producing sections of this continent. Time and again my own bees have had a good cleansing flight, and I was of the opinion that bees were wintering well. At the same time, I felt that it was more than likely that they might consume an unusual amount of stores: so I determined to examine them early this year to see if they were running short.

On Feb. 23 I went to one of the apiaries enclosed by a fence eight feet high, removed the cover from the four-colony wintering case, and after removing the packing of forest leaves quietly turned back the duck cloth. Twelve colonies were examined in this way, and the bees in them appeared to be in fine shape, every colony alive and the bees quietly clustering and having a clean book—all of which indicated good wintering. I left thoroughly satisfied that they were wintering well.

On March 2, when discussing this subject with Floyd Markham at his home in Ypsilanti, Mich., he was of the opinion that his bees were rearing brood. He said some colonies had for some time been carrying water; so we examined three of these. In one colony having a young queen, we found no brood. The second one, headed by an older queen, had brood in four combs. I noticed several cells which appeared as tho young bees had emerged from them, and there was capped drone brood. The reader can do his or her own thinking about this. The next colony had three combs with brood and quite a number of young bees.

My own bees are packed with thicker packing than Mr. Markham's. From the way my bees are clustered I doubt whether they are breeding at all, or as much as his; and, as the climate of Ypsilanti must be about the same as that of Brantford, I cannot help but wonder whether with thicker packing at the entrance of my hives the bees have not been less affected by outside temperature. It is my purpose to find this out very soon.

In any case beekeepers should take warning and find out as early as possible whether their colonies have plenty of stores. Many a beekeeper has lost colonies between April 1 and May 15, because they have been short of stores. R. F. Holtermann.

Brantford, Ontario.

GLEANED BY ASKING

Editors

QUESTION. — Will there be any harm in giving my bees combs of honey that have mould on them?

S. A. Sears.

California.

Answer. — A little mould on the surface of the combs does not necessarily injure honey or render it unfit for the bees. A strong colony will quickly clean up a comb that is badly moulded, apparently without harm to the bees.

HOW MANY COLONIES NEEDED FOR ORCHARD?

Question.—How many colonies of bees are required per acre of ten-year-old apple trees to insure proper cross-pollination of the fruit?

Washington. J. C. Hughes.

Answer.—Probably one or two good colonies per acre will be sufficient under favorable weather conditions; but, in the eastern portion of the country where rainy weather often interferes with the work of the bees, at the time of fruit bloom, a greater number of colonies would be needed. At such times the bees may not work very far from their hives, and it would be necessary in the case of a large acreage to have the colonies scattered thruout the orchard to insure proper cross-pollination.

RESISTANCE OF SPORES OF AMERICAN FOUL BROOD.

Question.—Does any authority know how much heat, gasoline, sunshine, rain, or any action of the elements will destroy the spores of American foul brood? Bruce Butler.

California.

Answer.—According to White, U. S. Department of Agriculture, Bulletin 809, the spores of American foul brood remain alive and virulent for years in dry remains (scales) of larvae and pupae dead from this disease. They are highly resistant to most of the ordinary destructive agencies. They may be killed when suspended in boiling water (212 degrees F.) for 10 minutes, but they withstand more heat when suspended in honey or honey diluted with water. Spores of American foul brood suspended in honey may withstand a temperature of 212 degrees F. for a half hour or more under laboratory conditions. For this reason the advice is usually given to dilute the honey from colonies having American foul brood and boil it in a closed vessel for a half hour to render it safe to feed to the bees. The temperature of the diluted honey at boiling point is, of course, higher than that of boiling water, which is 212 degrees F. at sea level.

In his experiments Dr. White found that these spores, when dry, were destroyed by the direct rays of the sun in from 28 to 41 hours. When suspended in honey and exposed to the direct rays of the sun, they were destroyed in from four to six weeks. When suspended in honey and shielded from direct sunlight they remained alive and virulent for more than a year. The spores were not killed by fermentation in seven weeks, and they resisted disinfectants when used in the ordinary strengths, such as carbolic acid and mercuric chlorid, for long periods of time. Gasoline would be of doubtful value as a disinfectant for American foul brood. The germs of European foul brood are much easier to destroy than the spores of American foul brood.

INCREASE PREVIOUS TO HONEY FLOW.

Question.—Is there any plan by which I can make two colonies from each of my colonies in the spring and build up both to full strength in time for the honey flow from clover? Harry E. Udd.

Nebraska.

Answer.—Since it requires nearly two months for colonies to build up to full strength in the spring, there is not enough time to make increase and build up both divisions previous to the honey flow from clover in the North where the main honey flow usually begins in June. Where the main honey flow does not begin until July or August, this can be done if the bees have wintered well, since there is then time for both colonies to build up. In your locality it will be better to make increase at the close of the honey flow or during the latter part of the honey flow. Increase is often made from brood that would emerge too late for the resulting bees to take part in the main honey flow. In this way the honey crop from the main honey flow is not reduced, as would be the case if some of the workers that should take part in gathering the honey crop were used to make increase.

SECOND HIVE-BODY TO PREVENT SWARMING.

Question.—Is it a good plan to give a second story filled with combs at the time of fruit bloom to increase brood-rearing, and then at the beginning of the honey flow to put the queen into the lower story? or would it be just as well to run both stories for brood all summer? Would two brood-chambers stop swarming? O. Kopplin.

New Mexico.

Answer.—Yes, this a good plan for producing extracted honey. The time of putting the queen into the lower story and confining her there by means of a queen-excluder will depend upon circumstances, but this is usually done soon after the beginning of the honey flow. Under some conditions after the queen is put down, it is better to put a super of empty extracting combs immediately above the queen-excluder and the former second story on top of the supers. This plan in some locations controls swarming almost completely, but it can not be depended upon to do so in all locations. One objection to permitting the queen to have the run of two stories thruout the season is the tendency of abandoning the lower story for brood-rearing later in the season when these combs are usually filled with pollen. Sometimes the lower corners of the combs are cut out when they are not in use, then later these openings are filled with drone comb.

GIVING SECOND HIVE-BODY ABOVE OR BELOW.

Question.—In building up colonies in the spring when two stories are used for brood-rearing, should the second hive-body with frames of foundation be placed below or above the colony, or distributed in both? Alan Eby.

Ohio.

Answer.—When only frames of foundation are given they should usually be distributed in both stories, with most of the foundation in the upper story. In fact, one or two frames of brood are enough to put into the second story, the remainder being frames of foundation. When empty combs are given to colonies that are strong enough in the spring to need a second story they may as well be placed on top, altho many beekeepers prefer to place them below if the weather is cool. A serious objection to placing them below is that the queen sometimes fails to go down and lay in the combs below even when crowded, especially when the upper portion of the combs in the lower hive-body is not suitable for brood-rearing on account of stretched cells. If the empty combs are placed above, the queen usually goes up readily if more room is needed, especially if old dark combs are used in the second story.

SHALLOW EXTRACTING SUPER TO PREVENT SWARMING.

Question.—How is this plan for comb-honey production? After unpacking in the spring, put on a shallow extracting super with foundation to provide more room for brood-rearing. Just before the honey flow, take this off and put on the supers. Would this do away with swarming? In the fall this super of honey could be put back before packing for winter. John P. Drake.

Missouri.

Answer.—It will be better to have the shallow extracting supers filled with combs instead of frames of foundation, for unless there is an early honey flow the bees would not draw out the foundation readily. You can, of course, induce them to do this by feeding, if necessary. When empty combs or combs containing some honey are given above the brood-chamber early enough, swarming is usually delayed, because of this additional room; but, when this shallow extracting super is removed and comb-honey supers are given, the colonies so treated will probably prepare to swarm if the season is at all favorable for swarming. The additional honey which your plan provides for next spring is an excellent thing for spring brood-rearing. See article on Comb Honey Production in this issue.

GIVING ADDITIONAL ROOM FOR SPRING BROOD-REARING.

Question.—How can I give my bees more room for brood-rearing after the lower hive is full when I have nothing to put in the supers but sections?

Ohio. Mrs. Arthur May.

Answer.—When your strongest colonies need more room for brood-rearing, previous to the honey flow, in producing comb honey, you will probably find some colonies that still have some combs which do not contain brood or much honey. If you find any such you can exchange combs of brood, together with the adhering bees, from the colonies that need more room for the empty combs from the hives which are not filled with brood. In this way you can give your strongest colonies more room and at the same time help those which are less strong. When making this exchange be sure that you do not take away the queen with the combs of brood. The empty combs that are taken from the weaker colonies should have the adhering bees shaken back into their own hives.

CLIPPING QUEEN'S WINGS.

Question.—Is it best to clip the queen's wings early in the spring to prevent swarming?

Iowa. Edward Melch.

Answer.—Clipping the wings of the queen does not prevent swarming. It only prevents the queen going with the swarm. This prevents the swarm from going away, since the bees will return when they find that the queen is not with them unless there happens to be another swarm out at the same time which has a queen that can fly. In such cases the two swarms may unite and later abscond if not cared for.

HOW MANY SUPERS NEEDED PER COLONY.

Question.—How many full-depth extracting supers will I need for each colony when using the standard 10-frame supers with eight combs in each super? Louis F. Kasch.

Illinois.

Answer.—You may need only one super or you may need three or more, depending upon the season and the character of the honey flow. In some localities the honey flow is so slow and the nectar ripens so quickly that much of the honey in the super may be ripened and sealed before the first super is filled, in which case the ripest honey may be extracted and the empty combs returned, leaving the unripe honey (usually the outside combs) in the hive to be ripened and extracted later. If by doing this the honey can be fully ripened and at the same time there are always empty combs in the super for incoming nectar, a single super may be enough.

In other localities the honey flow may be so rapid that a single super would not furnish sufficient room for the thin nectar for more than a few days, and sometimes two or three supers may be filled before any of the honey is ripe enough to be extracted. Where the honey flow is short and rapid, as it is sometimes in northern Illinois, the beekeeper is usually too busy to do much extracting during the honey flow. In such cases the only way that the full crop of honey can be secured is to have on hand plenty of supers, in order that when more room is needed it can be given at once.

In the clover region many beekeepers prefer to leave all the honey on the hives until after the close of the honey flow. When this is done there should be three or more supers for each colony, to take care of the crop during a good season.

TALKS TO BEGINNERS

By the Editor

ON the first warm day in April the beginner will be interested to note the activity at the entrances of the hives of his newly acquired colonies. If they are strong, many bees will be seen going to and from the hives in quite a businesslike manner. Some of the returning bees will be seen with little balls of pollen on their legs as they run into the hives. This pollen varies in color, depending upon its source, and by watching the bees as they work on the flowers it is possible to learn to distinguish by its color the pollen from the various flowers. Some of the returning bees which appear to be heavily laden may be carrying nectar, while others may be carrying home loads of water.

Opening the Hives.

In the South the beginner can now open his hives to examine his colonies, choosing a warm day when the bees are working well: while in the far North it may be best to wait till early in May, but being sure that the hives are heavy with honey in the meantime. Opening the hives and taking out the combs for examination too early in the spring is sometimes detrimental, but even in the North this may be done without injuring the colony if it is done on a bright, warm day when the bees are working freely. When such a day comes the beginner may as well see the many interesting things that are inside the beehive.

Before opening the hive the beginner should see that his smoker is properly lighted and going so well that it will not go out when he quits puffing for a while; then he should put on the veil and tie it down so snug that no bees can get under it. The beginner will feel safer the first time if he wears a pair of good bee-gloves, tho later he probably will not use them.

Now try out the smoker again and if it is going well approach the hive at one side, not in front. It is well to give a light puff or two of smoke at the entrance to subdue the guards. This is not always necessary, and the beginner will soon learn to judge the temper of the bees at different times.

Remove the outer cover, if a double cover is used; then by means of the hive-tool pry the inner cover up at one corner, at first less than one-eighth of an inch, so smoke can be blown thru the opening without any bees being able to come out. Next pry the adjacent corner of the cover loose, then lift one end of it, and, as this is being done, blow in a few puffs of smoke under the cover and over the frames, being careful to send a little smoke to the far end of the hive before the cover is entirely removed. Lay the cover upside down in front of the hive entrance, so the bees that were adhering to it can readily crawl into the hive.

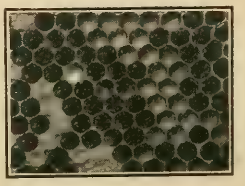
Now give a few light puffs of smoke over the tops of the frames (not down between them) to drive the bees down among the combs. The amount of smoke needed will depend upon the temper of the bees at the time they are being handled, but only enough smoke should be used to keep them under control. Too much smoke stampedes the bees and makes it more difficult to handle them.

How to Take Out the First Frame.

If the combs are of the self-spacing type, crowd the entire set of frames, toward the opposite side of the hive by using the hive-tool as a lever between the first frame and the side of the hive. This will give a space for removing the first frame. If enough space can be made in this way, the outside comb may be removed first, but if this comb has attachments to the side of the hive or is bulged with sealed honey, it may be better to remove the second or the third frame first. Pry the frames apart far enough to permit the easy removal of the frame selected. It may be necessary to raise the first frame slightly, one end at a time, by means of the hive-tool in order to enable the operator to take hold of the ends of the top-bar with the fingers. Now lift the frame gently, being careful to avoid rolling the bees against the adjacent comb. When the first comb is out stand it on end, leaning it against the hive where it will be out of the way. Any or all of the remaining combs can now be removed and examined at will, but care should be taken to keep the bees constantly under control. After a little experience the beginner will learn when more smoke is needed, by watching the behavior of the bees. If many of them line up in close formation, with heads upward, between the top-bars of the frames, watching every move of the operator, they should be driven down again among the combs by a few puffs of smoke.

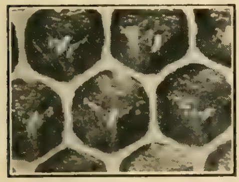
What to Look For.

Lift out a comb from the middle of the hive, hold it by the ends of the top-bar of the frame, and look it over carefully, as it should now reveal many things of interest. Note that some of the cells are covered or "capped," while others are open.


Capped brood in cells at the left, pollen in cells at the right.

In the upper corners of the comb there should be some sealed honey. Note the appearance of the cappings; then, to be sure that this is sealed honey, tear away the capping from a few cells. Below the sealed honey there may be a few rows of cells of recently gathered honey.

Look for capped cells in the middle of the comb. This is sealed brood if the comb is from the middle of the brood-nest. To be sure of this tear away a capping and note that it contains an immature young bee in its pupal or late larval state of development. Note the difference in the appearance of the cappings of the brood and the cappings over the honey. In the middle of the area of sealed brood young bees may be seen emerging from the cells. Note how they first cut away the capping to release themselves.



Eggs are placed in regular order by a normal queen.

At the outer margin of the area of sealed brood in the first open cells, look for the nearly full-grown larvae. Note their pearly white color which is characteristic of healthy larvae. Beyond the full-grown larvae, toward the outer edge of the comb, smaller larvae will be found. Hold the comb so the sun will shine down into the cells, and by looking carefully even the smallest of the larvae, those which have just hatched from the egg, may be seen.

Beyond the smallest larvae, eggs may be seen attached to the base of the cell. Note the regularity with which the eggs are placed in the cells, few if any cells being vacant. This tells you that the queen is normal and prolific. It is difficult, at first, to see the eggs and the smallest larvae, but by turning the comb in the light until it strikes the base of the cell these can be seen.

The arrangement of the brood of different ages, as described above, is not always present on all of the combs, because later when young bees emerge from the middle of the comb the queen will again lay eggs in these cells now surrounded by sealed brood. Later in the season this arrangement may be broken up entirely. Between the upper margin of the brood and the lower margin of the honey there are usually a few rows of cells containing pollen. This can readily be detected, being packed down in a solid mass in the cells. By looking carefully, cells may be found having two little pellets of pollen not yet packed down but lying loosely just as the worker left them when she kicked them from the pollen baskets on her legs.

By looking at the open cells it will be noted that little patches of comb usually in the lower corners of the frame have cells of greater diameter. This is drone comb, while the comb having smaller cells is worker comb. If the colony is strong there may be some drone brood present during this month, even in the North; while in the South drone brood, as well as emerged drones, can now be found in strong colonies. Drone brood that is sealed has peculiar convex cappings, which resemble a layer of spherical bullets.

In some of the southern States, queen-cells built preparatory to swarming may be found in some of the strongest colonies at this time, but in the North these usually are not built until in May or June.

It is not necessary to tell the beginner that the vast majority of the bees on the combs are workers. If drone brood was found, there may be some adult drones among the workers. These large heavy-set bees may readily be found if any are present, and when one is found he can be picked up with the fingers without danger, as he is not armed with a sting.

The beginner may see the queen the first time he examines the colony, if he has been careful not to stampede the bees and thus frighten her so she hides away in some obscure corner. If the bees are gentle Italians the queen may go on quietly with her work, laying eggs, even while the comb is out of the hive.

How to Handle the Combs.

In handling the combs, all quick motions should be avoided. Do not move the hands across the top of the frames, but keep them near the ends of the hive. Bees resent any quick motions and may dart out to sting if the operator moves too quickly.

To look at the opposite side of a comb it should first be turned with the top-bar in a vertical position, still holding the frame by each end of the top-bar. The comb can now be turned on the top-bar as an axis, after which the top-bar is again brought back to a horizontal position, but this time the frame is upside down. This process is reversed in turning the comb back to normal.

What Can Be Learned by This Examination.

The presence of worker brood in all stages of development tells the observer that his colony has a normal queen whether he sees her or not. The presence of sealed honey in the upper corners of the combs and in a greater portion of one or two of the outside combs tells him that the colony is not lacking in its food supply. The presence of drone brood tells him that the colony is at least fairly strong and prosperous. The presence of many empty cells, if any, tells him that the bees do not need more room at this time.

In the northern States such colonies need only to be kept snug and warm during April, by seeing that the cover fits down all around, by leaving the winter packing in place, and by blocking down the entrance to about one or two inches in width and not more than three-eighths of an inch high.

In the southern States colonies may need more room this month. If the brood-chamber is well filled, outside combs and all, and the bees are elongating some of the cells in the upper portion of the comb with new white wax built on the old dark comb, they need their supers, which should be put on without delay if the bees are working well.

BEES, MEN AND THINGS

(You may find it here)

THE principal time for making honey in this locality is in the fall, altho occasionally we get a fair spring flow from white clover. This, however, is very uncertain. We have not a sufficient amount of sweet clover in this community to be of any benefit from the standpoint of the beekeeper, and it seems that the farmer is adverse to sowing it, and no one seems to push this matter here; so we have practically nothing to depend upon when the white clover fails. Our main source of honey is the angel-pod vine or blue vine which grows very abundantly along the Ohio river bottoms. This, of course, does not come until fall. However, I believe that, with the proper support and co-operation between our county agent and the farmers, this community could be made an ideal one thru the planting of sweet clover.”—R. W. Gronemeier, Posey County, Ind.

“No more two-story wintering for me. No more slab honey feeding even with combs scraped and honey dripping. I could not get the pep into them this way. I go back to my old way of spring stimulating. This slab business is probably all right for the big boys with hundreds or thousands of colonies, but I don't believe it is good for the sideliner who wants a big yield from a few.”—A. W. Lindsay, Wayne County, Mich.

“A certain honey salesman in one of the western States devised a unique way in which to dispose of extracted honey. He rigged up the delivery box on the back of his Ford runabout, so that two five-gallon cans of honey could be set on and liquified, and kept liquid, by the use of the exhaust gas. There was a shut-off in the pipe just before it reached the cans of honey, so that it could be turned off before heating the honey too much. The salesman, referred to, sold 7,000 pounds of honey at 25c a pound in a little over three weeks, by going from house to house in a city of 3,000 people, and delivering honey in whatever containers the customers supplied.”—George W. York, Spokane County, Wash.

“On Saturday, Feb. 12, Home Economics Day was celebrated at Iowa State College. This annual event is prepared for by more than 1000 girls and looked forward to by 2500 boys. One of the exhibits was bees and honey. This was on a large table and attracted the attention of every one who visited the building. There were those of the girls who expressed the desire to see a real queen with her circle of attendants and those who loitered around the observation hive for a farewell glimpse of the royalty. Some of the boys were interested in the samples of honey collected from California, Utah, Louisiana, Florida, and many other States. Often those of artistic turn of mind admired the oil painting made by Dr. A. F. Bonney. There were housewives who were very much interested in the grades of extracted and comb honey, as well as the commercial packages of honey. All of these phases of the exhibit had a special class of interested spectators, but there was not a single visitor who was not interested in the wonderful display of cakes, cookies, and candies made with honey. The girls viewed with envy, the boys viewed with a lingering longing, and the housewife with serious interest.”—F. B. Paddock, Story County, Iowa.

“The winter has been so dry and mild that I could not retain the bees in the cellar any longer. Today (Feb. 24) I removed them. They are very populous, with brood in all stages in every one examined except one which is queenless. The thermometer today at noon registered 72 degrees F., and the demand for water by bees is indication that brood-rearing must be very well under way. Rose bushes and lilacs are beginning to show leaves.”—A. E. Trapp, Fergus County, Mont.

“We have just concluded a series of short schools in beekeeping in western Washington. We have held a series of one to three day schools at Wishka, Elma, Olympia, Puyallup, Seattle, Shelton, Everett, and Bellingham. The average attendance has been about 80 for each locality, and at Seattle we had an attendance of 360 at one of the sessions. Seattle had over 200 **bona fide** beekeepers in attendance. I believe we have made a record—at least for the Northwest, in getting so many beekeepers together under one roof. This work has been put on by the State Division of Apiculture, co-operating with the extension service of the State College and with the local farm bureaus.”—Dr. A. L. Melander, Entomologist, Whitman County, Wash.

“I have my bees outdoors packed in three different ways, and some not packed at all except for the double-walled hives, and invariably the ones in the packing cases are out for a flight from one-half to an hour before the others. My packing cases have four inches of packing on the bottom, six at the side, and eighteen on top.”—Frank R. Huff, Cook County, Ills.

“All my bees came thru winter all right, and several had young drones flying 5th of March—something unusual in this locality. They were working today like the good old summertime.”—A. C. Smith, Columbiana County, Ohio.

JUST NEWS

Editors

It is now proposed to change the name of the "annual sweet clover" to that of Hubam, this word being suggestive of Hughes and Alabama, thus bringing to mind at once the name of Prof. Hughes, who discovered this wonderful new plant and traced it to its native home in Alabama.

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Latest reports by wire state that recent copious rains in southern California make a good crop from sage almost certain; and, just as we go to press, a telegram from Texas reports fine prospects from mesquite and horsemint.

* * *

Prof. Wilmon Newell has been appointed Dean and Director of the College of Agriculture, University of Florida at Gainesville, Fla. This means much, not only for beekeeping in Florida but for beekeeping in general, as Prof. Newell is at heart, first of all, a beekeeper. He will continue in close touch with Florida beekeeping, and probably continue in charge of the inspection service of that State.

* * *

Cary W. Hartman, the enterprising president of the Alameda County (California) Beekeepers' Association, was unanimously elected president of the California State Beekeepers' Association at the final session of the State convention on March 5. Mr. Hartman succeeds J. E. Pleasants of Orange County. M. H. Mendleson of Ventura was elected vice-president, and L. W. Lassell of Oakland, secretary-treasurer.

* * *

Beekeepers who need help should inquire regarding the Federal Board for Vocational Training and its activities. This board has charge of re-educating for new duties men who have been partially disabled in the World War. Many men have been studying beekeeping in the various colleges and schools. These men are ready for "placement" or field training with commercial beekeepers during the season of 1921. The obligation the beekeeper takes in exchange for the help given by these men is to see that an opportunity is given to learn methods of honey production, queen-rearing, etc., in actual practice. The board pays them a living salary. Beekeepers who wish to use these men and thus give them a lift over their difficulties in re-establishing themselves should investigate this opportunity at once.

* * *

According to an Associated Press dispatch from Berlin, the number of colonies of bees which the Entente demanded from Germany in reparation is 25,000. It appears that the German representatives have made counter proposals to the reparation commission as to the number of bees, Belgian hares, and dogs to be delivered, and that a decision as to the exact number has been postponed for a month. The ship carrying the miscellaneous assortment of animals, which are being demanded from Germany, will have almost as great an assortment as Noah's ark.

* * *

The following proclamation was issued by Governor Stephens of California on Feb. 26, 1921:

"Whereas, California leads all other States in the production of bees and honey, and boasts in this activity an industry bringing in a revenue of $3,000,000 annually to this commonwealth, and

"Whereas, The California State Beekeepers' Association, which is responsible for the upbuilding of this valuable and productive industry in the State of California, will hold its thirty-second annual meeting in the city of Oakland, March 2, 3, 4, and 5.

"Now, therefore, I, William D. Stephens, Governor of the State of California, having the welfare of all California industries at heart, and believing the honey industry to be one which should receive the co-operation of our citizens, do hereby designate March 1 to 7 as California Honey Week, and appeal to all citizens of the commonwealth to patronize products of the beekeepers of the State during that period.

"William D. Stephens, Governor.

"Dated: Sacramento, Feb. 26, 1921."

* * *

The committee having charge of the Dr. C. C. Miller Memorial submits the following:

Regarding the subscriptions of beekeepers to the C. C. Miller Memorial fund, it is desired by the committee to secure at least $5,000 to establish a scholarship bearing this name; using only the interest of the money gathered, annually through a trustee committee, for a scholarship in beekeeping and allied sciences. Altho it was first suggested by Gleanings that the subscriptions be limited to $1, it has been decided not to put any limit upon the amounts to be accepted, but as small a sum as 25 cents will be welcome. The members of the committee, named below, will receive the funds. All the amounts will be acknowledged in the American Bee Journal or Gleanings, or both. It is desirable that the greater number of subscriptions be forwarded by subscribers before June 10, at which date Dr. Miller would have been 90 years of age. It behooves the beekeepers of America to thus celebrate the anniversary of this great man, who is acknowledged by the beekeepers of the entire world as one of the most deserving members of the craft. We shall be glad to have the other bee magazines lend a hand in this and publish such lists of subscriptions as they may be able to secure. If all pull together, we should secure a worth-while sum. Send subscriptions to: C. P. Dadant, Hamilton, Ill.; B. F. Kindig, East Lansing, Mich.; E. G. LeStourgeon, San Antonio, Tex.; Dr. E. F. Phillips, Washington, D. C.; E. R. Root, Medina, O.

OUR HOMES

A. I. ROOT

The wages of sin is death: but the gift of God is eternal life.—Rom. 6:23.

Thou shalt not kill.—Ex. 20:13.

For he loveth our nation, and he hath built us a synagogue.—Luke 7:5.

ON page 754 of the December Gleanings I mentioned J. H. Miller of Newark, O., the man who had just "built a synagogue." Well, during the Sunday afternoon Ernest and I spent at his home he gave us many important lessons and facts in regard to "civic government." His sudden death shortly after calls forth this Home Paper. The following is taken from the American Issue:

> Former Senator J. H. Miller of Newark died at his home in that city Dec. 6th. Mr. Miller was the leader of the dry forces in his home city some years ago when it required moral and physical courage to be prominently identified with the Prohibition cause.
>
> No other town in Ohio was dominated by a worse gang of wet ruffians than was Newark a dozen or fifteen years ago. The members of this gang not only ran the saloons, but the officers and the town as well. They had no regard for law or decency. They were brutal and defiant.
>
> Mr. Miller stood out as the leader of the moral forces of the community during those dark years. He was unassuming and mild-mannered, but he was not afraid. He fought that wet crowd thru the years. They tried to destroy him and his business. They attacked him one night with the evident purpose of killing him, and they almost succeeded, for he carried to his grave evidence of his struggle.
>
> This was about the time the attention of the country was directed to Newark by reason of the lynching of a dry detective by a mob directed by the saloonkeepers. It was the beginning of the end. Prohibition came to Newark, the old wet gang was scattered, and a new and better day dawned on that busy little city.
>
> Mr. Miller often remarked in the more recent years that God was good to him to permit him to live to see the new Newark, and to have its people realize the blessings of Prohibition. Not only did he live to see the change, but his fellow-townsmen and his district honored him by electing him to the Ohio Senate where he served with credit to himself and his constituents.
>
> But nothing in his official life overshadowed what he accomplished as the dry leader of Newark in the days when such leadership invited death itself.

The following from one of the great men of our day gives us some further light in regard to the man:

> My Dear Mrs. Miller:
>
> I did not learn of your husband's death until I passed thru your city last Thursday. I am greatly shocked and distressed at the sad news.
>
> I prized his friendship and appreciated his high character and sturdy citizenship. His death is a loss to our party and his State. To me it is a personal grief. I share your sorrow.
>
> With sincerest sympathy, I am,
>
> Very truly yours,
> W. J. Bryan.

In the American Magazine for April, 1911, appeared an article by Ray Stannard Baker, entitled "The Thin Crust of Civilization: A Study of the Liquor Traffic in a Modern American City." From this article descriptive of the Newark riot (July 8, 1910), I make clippings as below:

> One night they threw beer bottles thru the windows of Judge Seward's home; another night they attacked Secretary Mitchell's house; they sent threatening letters; and finally, one evening not long before the riot, three thugs followed J. H. Miller thru the streets and just as he reached home assaulted and beat him brutally, knocking in his teeth. He wears the scars to this day.
>
> . . . .
>
> While the iron doors of the jail were being beaten down, and while the man, Etherington, was being taken from the jail and hanged at the corner of the courthouse square, this man, wearing the uniform of chief of police, was then at a nearby grocery and saloon, in company with others, engaged in a social game of cards.
>
> . . . .
>
> I went to the county jail, where all the men who had been caught were locked up. It was one of the most tragic sights I ever saw in my life. I had expected to find a group of hard-looking rowdies. Instead of that, most of the prisoners were scarcely more than boys—"just town boys," the sheriff said. One, charged with first degree murder, was only 17 years old, two were 19, two were 20, two were 22, two were 23 and two were 24. The others were mostly under 30 years old—just full-blooded, adventurous, excitement-loving boys. Most of them had been educated right there in the public schools of Newark and had grown up there—ripe products of the Newark system.
>
> What a farce it all is! Spend thousands yearly in schools, boast about enlightenment, and turn boys and girls loose for amusement in a town infested with 80 saloons and 30 or 40 houses of prostitution! There were half a dozen or more schools in Newark, 16 churches, one feebly-supported Young Men's Christian Association building, no playgrounds, no library building at all—and 80 saloons, occupying the best business sites in town and working day and night!

During that eventful Sunday afternoon Mr. Miller gave me some important facts in regard to the Newark tragedy that I think have never been published. I asked what afterward became of the leaders of that gang of anarchists. I think he counted up *a full half dozen* who *committed suicide*. Sad to relate, quite a few *women* took part. While poor Etherington was being drawn up by the rope, one *woman* yelled, "Pull him up higher, so we *women folks* can see him." This woman was a suicide inside of a year. See our first text. "The wages of sin" are not always paid "every Saturday night," but they are *sure to come*, sooner or later. I may not have got it correctly, but I think the chief of police who played cards, while the mob ruled the town, was one of the officials who committed suicide. Is there any lesson, right here, for *other* towns besides Newark in our State of Ohio?

Just recently a prominent *judge* in the great city of Cleveland, Ohio, admitted in court he visited saloons after midnight, and drank *brandy*. This in our Ohio where prohibition is supposed to rule!

Just think of it! A judge, who holds the destiny, the happiness, and even *the lives* of good people in the "hollow of his hand!"

Now for something a little pleasanter. Mr. Miller, as soon as he learned we were in his city, took us to his church and his Sunday school. On the way he explained he found in the suburbs a residence which they had changed over into a church. Of course, the ground and building were paid for by subscription, but Miller was "prime mover." He explained before and after services how the changes were made. He took us into the basement, showed us the up-to-date furnace, and what greatly interested me was comfortable toilet rooms for both sexes. When you get to be 80 years old or more, you will surely appreciate things of this kind if you never have before. Ernest and I were both called upon to talk to one of the brightest big Bible classes it was ever my fortune to see. I wrote home to Mrs. Root my right hand was sore yet from the many "handshakes" and hand "squeezes," the latter mostly from the *women* folks.

This man Miller was a *lawyer*. How many lawyers have we that are even *followers* of the Lord Jesus Christ? Is there not a new order of things coming, along this line?

Was I not right in quoting in regard to friend Miller,

"For he loveth our nation and he hath built us a synagogue"?

HIGH - PRESSURE GARDENING

FLORIDA NEW POTATOES, $4.80 PER BUSHEL.

I see by the Cleveland Plain Dealer that potatoes are "away down" up North; but, in the same daily, I see, also, that Bermuda *new potatoes* are (as usual at this season) $12.50 to $14.00 a barrel. Why this great price when old potatoes in some places are almost "a drug on the market?" Several years ago I went over to Bermuda to study their potato business. They get this price because of their extra-nice *new potatoes*. For 10 years or more I have been doing the same here in our Florida home. About the middle of February a grocer came to me and wanted some new potatoes. Altho they were not as yet fit to dig I gave him a few at about $5 a bushel, and every day until now (Mar. 10) he comes right out to our garden and takes all we can scrape up, big and little, at the same price. Just now we are giving him two bushels a day, and they are sold at 60c a ½ peck almost before he can unload them. I have told you with pictures, etc., how we raise them every spring; so it seems hardly necessary to go over it again; but, as I have worked out some improvements, I will try once more to show you good people up North a little "gold mine" you can "dig out," right in your own "back yard." Right now, as your eye rests on these pages, is the time to "get busy," and to get health and "gold dollars," at one and the same time. I am testing new kinds of potatoes every winter, but so far I have found none so good as the Red Bliss Triumph. Buy northern-grown seed and cut to one eye or two eyes. Now place these pieces in a box indoors, or in a protected bed outside spaced about 4 inches apart like the cells in a honeycomb, say one in the center and six all around it. Why this bother instead of planting where they are to grow? For many reasons; mainly, instead of planting a *potato* at the proper time you plant a "*potato plant*." Again, this group of plants generates heat, so as to stand frost, and assists rapid growth. To test it, plant some in the usual way, and compare with those in the bed when leaves first begin to show. You also get ahead of weeds. If you have only a little ground, during the first two or three weeks your crop needs but little room. We grow *two* crops every winter on the same ground inside of the six months we stay here in Florida. Keep the little bed of plants well watered, but not *too wet*. Whatever you do, find some clean rich soil so soft and loose your potatoes will never be crowded out of their natural shape by clods or sticks and stones. In Bermuda the workman claims the ground isn't in proper shape, unless he can push his naked arm down into the soil up to his elbow. We are digging potatoes now as smooth and round as an apple, some of them weighing a pound or more. Girls and women can grow Bermuda potatoes just as well as men and boys. Wesley digs and washes the potatoes, and the grocer delivers them in clean, new baskets to the good wives in such condition that all they have to do, is to dump them into boiling water. If you are cooking green peas, sort the small potatoes* and cook them *with* the peas. These new potatoes, especially if not really mature, should be cooked at once—the same day as dug, if it can be managed—to avoid having them lose their attractive appearance by being exposed too long to the light. Therefore, the grower should be careful about rushing on to the grocer more than what he will probably sell each day. More about it, with pictures, in next issue.

*Very small potatoes, boiled and mashed with wheat middlings, compose the best feed to make hens lay, that I know of.

SWEET CLOVER SEED HULLER AND SCARIFIER.

Here is a homemade scarifier that A. I. Root thinks is a good thing and suggests that it be illustrated in this department.

Dear Mr. Root:

To make a clover huller and scarifier that gives good results, cut pieces as follows: 1 board, 12 inches wide, 30 inches long; 2 pieces, 1 inch by 1½ inches, 30 inches long; 1 piece same dimensions, 9 inches long; 2 pieces, 1 inch by 4 inches, 12 inches long.

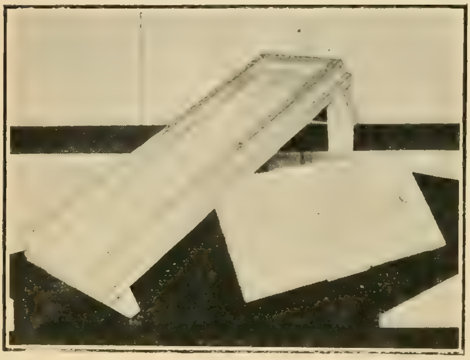

Fig. 1.—Homemade huller and scarifier. Rubber-board removed and leaning against bed in which it fits.

Nail edgeways the 1 x 4-inch pieces across the 12-inch board 1 inch from ends on bottom side; next put 1½-inch strips edgeways 9 inches apart and the 9-inch strip between long ones at the top. This completes a bed for the rubber to fit in. For the rubber, use a board 20 inches long and 9 inches wide. Take a piece 1 x 4 x 9 inches long, bore a hole in center and put a piece of broom-handle 6 inches long in this hole for a handle. Nail this crossways of the rubber board 6 or 8 inches from the end. Give the rubber board a little bevel on under corner at upper end of board, to let seed feed under easier. Next put two sheets of coarse emery cloth on the bottom of the rubber, using small tacks like those used in making plant baskets, berry crates, and window curtains; also put two sheets in the bottom-board between the strip, the top edge of the cloth being 8 inches from the end of board, tacking the cloth about 1 inch between tacks around the edges to keep the seed from working under. Tack heads should be driven down below the surface of the emery or they will soon cut out the emery cloth. Sandpaper will do if emery cannot be had, but it does not last long.

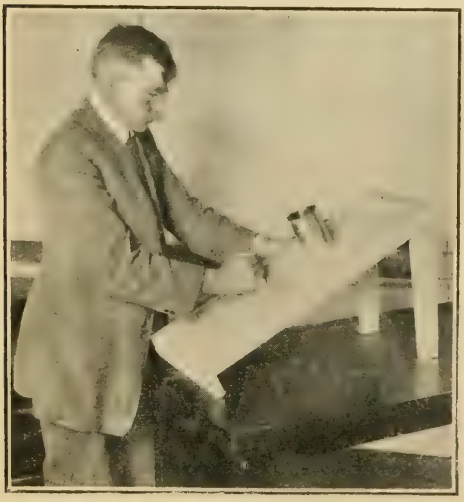

Fig. 2.—Method of using homemade huller and scarifier.

You can feed with one hand and rub with the other. Do not draw the rubber up to the end of the board, and keep a supply of seed above. By giving this huller about 30 degrees pitch, the seed will roll down and feed itself from the supply at the upper end of the bed-board.

Both wide boards should be planed and true-faced, not warped. If they are not true the cloth will soon wear out on the full spots, and the seed will slip between, unhulled. This outfit will hull 90 per cent of the seed that goes thru. If you want to make the huller a little handier, bore a ¾-inch hole in the center of the rubber board, 2½ inches from the upper end. Take a ½-gallon bucket, cut a hole in the bottom to fit the hole in the board, and then tack it to the board. By filling the bucket with seed and slightly raising the upper end of the rubber board, the seed will run out the hole from the bucket and feed between the emery cloths. Screen the seeds by using a pan-shaped flour-sifter. It has just the right mesh wire, and the unhulled can be put thru the huller again. The huller not only hulls, but scarifies the seed at the same time. By using a little energy and skill a bushel of seed can be cleaned in a day, and it is as clean as any bought from the seed store.

Ludlow, Ky., Dec. 17, 1920. S. Rouse.

STATEMENT OF OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., OF GLEANINGS IN BEE CULTURE, PUBLISHED MONTHLY AT MEDINA, OHIO, REQUIRED BY THE ACT OF AUGUST 24, 1912.

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Sworn to and subscribed before me this 10th day of March, 1921. H. C. WEST, Notary Public.

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FOR SALE—Honey in 5 and 60 pound cans.
Van Wyngarden Bros., Hebron, Ind.

FOR SALE—Choice clover-basswood blend honey in new 60-lb. cans. J. N. Harris, St. Louis, Mich.

FOR SALE—25 barrels, amber extracted honey, 12½c per pound. H. G. Quirin, Bellevue, Ohio.

FOR SALE—Choice white clover honey in 60-lb. cans—none finer. J. F. Moore, Tiffin, Ohio.

FOR SALE—Clover and buckwheat honey in 60-lb. cans. Bert Smith, Romulus, N. Y.

FOR SALE—Choice clover extracted honey. State quantity wanted. J. D. Beals, Oto, Iowa.

FOR SALE—Clover, amber, and buckwheat honey in 60-lb. cans, or 5-lb. or 10-lb. pails. C. J. Baldridge, Homestead Farm, Kendaia, N. Y.

BEST offer takes clover, basswood, and buckwheat honey, in new cans and cases.
Howard H. Choate, Romulus, N. Y.

FOR SALE—Fancy white alfalfa honey, fine for bottling; $16.50 per case of two 60-lb. cans.
S. J. Harris, Olathe, Colo.

FOR SALE—Choice white-clover extracted honey. $20.00 per case of two 60-lb. cans f. o. b. Holgate.
Noah Bordner, Holgate, Ohio.

FOR SALE—Well-ripened, thick and rich white-aster honey in 120-lb. cases at 15c f. o. b. Brooksville, Ky. Sample 25c. H. C. Lee, Brooksville, Ky.

FOR SALE—Clover, basswood or buckwheat honey, comb and extracted, by the case, ton, or carload. Let me supply your wants with this fine N. Y. State honey. C. B. Howard, Geneva, N. Y.

FOR SALE—A No. 1 white-clover extracted honey in 60-lb. cans, 2 cans per case. State how much you can use and I will quote on same.
L. S. Griggs, 711 Avon St., Flint, Mich.

FOR SALE—White clover honey, almost water white. Put up in new 60-lb. tin cans, two to the case. Write for prices.
D. R. Townsend, Northstar, Mich.

FOR SALE—White honey in 60-lb. cans, sample and price on request. Also white clover comb, 24 sections to case. The A. I. Root Co., Inc., 23 Leonard St., New York City.

FOR SALE—10,000 lbs. A1 quality white sweet clover honey, in new 60-lb. cans. Will sell in quantities to suit. Sample free.
W. D Achord, Fitzpatrick, Ala.

FOR SALE—Extra choice extracted white clover honey, put up in new 60-lb. cans and 5-lb. pails, Sample, 20c, same to apply on first order.
David Running, Filion, Mich.

FOR SALE—10,000 lbs. of No. 1 white aster honey, pure in every respect and fine flavor, put up in 60-lb. cans at 10c per lb. f. o. b. Brooksville, Ky. Sample, 25c. W. B. Wallin, Brooksville, Ky.

FOR SALE—White honey, 15c a lb.; L. A. alfalfa, 14c, in two 60-lb. cans; Chilian in 165-lb. kegs, 10c; light amber honey in 50-gal. bbls., 80c a gal. Beeswax, 30c a lb.
Walter C. Morris, 105 Hudson St., New York City.

FOR SALE — Well-ripened extracted clover honey, 20c per pound; buckwheat and dark amber, 17c, two 60-lb. cans to case. Clover in 5-lb. pails, $1.25 per pail; buckwheat and amber, $1.00 per pail, packed 12 pails to case, or 30 to 50 pails to barrel. H. G. Quirin, Bellevue, Ohio.

FOR SALE—Finest quality clover extracted honey in new 60-lb. tins at greatly reduced price to close out balance of 1920 crop. Say how much you can use and we will be pleased to quote you our lowest price. Address E. D. Townsend & Sons, Northstar, Mich.

FOR SALE—Delicious raspberry-basswood-milkweed honey by parcel post or express, nicely crated. 5-lb. pail, $1.25; 10-lb., $2.40, and 60-lb. can, $12.00 f. o. b. here. Honey is liquid and put up with same care as bottled goods. Write for prices of pails in quantity lots or granulated honey in 60-lb. cans. Sample 10c.
P. W. Sowinski, Bellaire, Mich.

HONEY AND WAX WANTED.

BEESWAX WANTED—For manufacture into SUPERIOR FOUNDATION. (Weed Process.)
Superior Honey Co., Ogden, Utah.

WANTED—Beeswax, also old combs and cappings to render on shares.
F. J. Rettig, Wabash, Ind.

BEESWAX wanted. Old combs (dry) and cappings for rendering. Also wax accepted in trade. Top market prices offered.
A. I. Root Co. of Iowa, Council Bluffs, Iowa.

WANTED—Extracted honey, state quantity, how packed. Send sample. Quote lowest cash price, delivered Terre Haute, Ind. W. A. Hunter, 119 So. 3rd St., Terre Haute, Ind.

WANTED—Shipments of old combs and cappings for rendering. We pay the highest cash and trade prices, charging but 5c a pound for wax rendered. The Fred W. Muth Co., Pearl and Walnut Sts., Cincinnati, O.

OLD COMBS WANTED—Our steam wax-presses will get every ounce of beeswax out of old combs, cappings, or slumgum. Send for our terms and our new 1921 catalog. We will buy your share of the wax for cash or will work it into foundation for you. Dadant & Sons, Hamilton, Illinois.

WANTED—Beeswax. We are paying 1 and 2c extra for choice yellow beeswax, and in exchange for supplies we can offer a still better price. Be sure your shipment bears your name and address, so we can identify it immediately upon arrival, and make prompt remittance.
The A. I. Root Co., Medina, Ohio.

FOR SALE.

HONEY LABELS—New designs. Catalog free. Eastern Label Co., Clintonville, Conn.

FOR SALE—A full line of Root's goods at Root's prices. A. L. Healy, Mayaguez, Porto Rico.

ROOT'S goods at Root prices. A. W. Yates, 3 Chapman St., Hartford, Conn.

FOR SALE—My 8-frame power-driven extractor with honey pump. J. F. Moore, Tiffin, Ohio.

WRITE for prices on my cypress beehives and supplies. J. Tom White, Dublin, Ga.

FOR SALE—SUPERIOR FOUNDATION, "Best by Test." Let us prove it. Order now. Superior Honey Co., Ogden, Utah.

ROOT'S BEE SUPPLIES—For the Central Southwest Beekeepers. Beeswax wanted. Free catalog. Stiles Bee Supply Co., Stillwater, Okla.

PUSH-IN-THE-COMB CAGES — Quickest and safest way to introduce queens, 50c postpaid. F. R. Davis, 203 Oak St., Weehawken, N. J.

BEEKEEPERS' SUPPLIES—Root's good at factory prices. Send for 1921 catalog. F. D. Manchester, Middlebury, Vt.

FOR SALE—Root automatic 4-frame extractor. Hand and power driven. Price, $75.00. L. F. Howden, Fillmore, N. Y.

FOR SALE—40 eight-frame hives and 130 comb-honey supers, also 120 Ideal comb-honey supers. William Davenport, 2111 Noyes St., Evanston, Ills.

FOR SALE—New metal-spaced frames. Send 5c for sample frame and new low price, also new 10-frame hive bodies. Wm. Craig, Aitkin, Minn.

FOR SALE—500 lbs. Dadant's medium brood foundation at 75c a pound in not less than 50-lb. lots. M. C. Berry Co., Hayneville, Ala.

PORTER BEE-ESCAPES save honey, time, and money. Great labor-savers. For sale by all dealers in bee supplies. R. & E. C. Porter, Lewiston, Ill.

FOR SALE or on shares, 14 apiaries, one or all. Healthful location with American school and church in town, on stone road. Last crop over 40 tons. M. C. Engle, Herradura, Cuba.

FOR SALE — Good second-hand double-deck comb-honey shippng cases for 4¼ x 4¼ x 1⅞ sections, 25c per case, f. o. b., Cincinnati. C. H. W. Weber & Co., 2146 Central Ave., Cincinnati, Ohio.

FOR SALE—One 10-inch foundation mill, 2½-inch rolls, practically new; can save the price of same in making 100 lbs. of foundation. Also one 6-in. mill, 2-in. rolls. W. D. Wright, Altamont, N. Y.

FOR SALE—Lot of new supplies. Lewis make. sections, foundation, hives, supers, covers, etc., at bargain prices. If interested write for complete list. C. C. Brinton, Bloomsburg, Pa.

FOR SALE—A Wisconsin honey outfit consisting of 150 colonies of bees, all necessary fixtures for extracted and comb honey, together with my home and six acres of good garden soil. Arthur Schultz, Ripon, Wisc.

FOR SALE—One four-basket automatic Root honey extractor only used ten days. Reason for selling, got a power machine. E. B. Weirich, Route 10, Kalamazoo, Mich.

FOR SALE—Maxfer two-ton truck attachment to convert your old Ford into best truck. Used one year but very little and practically as good as new. 32 x 4 tires, 156-inch wheelbase, weight 1200 lbs. All complete, perfect condition. Costs now $400, will sell for $250. L. F. Howden, Fillmore, N. Y.

FOR SALE—300 standard Langstroth drawn combs, metal-spaced and wired, in very good condition. Been used only a few years. Will sell to highest bidder. James L. Fish, Indian Lake, Box No. 53, N. Y.

FOR SALE—Good second-hand empty 60-lb. honey cans, two cans to the case, at 60c per case f. o. b. Cincinnati. Terms, cash with order. C. H. W. Weber & Co., 2146 Central Ave., Cincinnati, Ohio.

FOR SALE—500 pounds of Dadant's light brood foundation for Hoffman frames, put up in boxes holding 50 pounds net. This foundation is in the best of shape, the same as I received it. I will not accept orders for less than one box. Price, 75c per pound. M. E. Eggers, Eau Claire, Wisc.

FOR SALE—Owner wants use of one of our outside warehouses, so we must move this stock. Slightly dusty and shop-worn, 1-story 8-frame hives, packages of five, $15.00; also a new 10-frame, $17.50. Offer good only as long as this stock lasts. A. G. Woodman Co., Grand Rapids, Mich.

FOR SALE—50 ten-frame comb-honey supers for 4¼ x 4¼ x 1⅞ sections; 10 eight-frame for same sec. All painted. Nailed corners, not dovetailed. Also one Manum swarm catcher. 10 queen and drone traps and 30 second-hand shipping cages for 2-lb. packages. If interested, write. The Blue-Hive Apiaries, Preston, Iowa.

FOR SALE—75 Jumbo hives, metal and inner cover, reversible bottom, $3.00 each, 60 extracting supers 6¾-inch, 75c each; 20 standard bodies with drawn combs, $1.75 each; some 4¼ x 4¼ and 4 x 5 comb-honey supers, all 10-fr. size. All nailed and painted, guaranteed as good as any other hive, and in A-1 shape. No frames or bees. A. H. Hattendorf, Ocheyedan, Iowa.

AM selling out. 3000 sections 4 x 5 x 1½, $11.00 per 1000, in 1000 lots or more; 1000 fences for 4 x 5 sections, $4.00 per 100 in 200 lots or more, 50 shipping cases (Lewis) at 50c each, but must take the whole crate; 20 lbs. thin surplus foundation (Dittmer), 80c per lb., in 10-lb. lots or more. All goods are new, just as I bought them. $110 takes the whole lot. Order quick. Fred A. Krause, Ridgeland, R. D. No 1, Wisc.

FOR SALE—T supers made for me on special order by A. I. Root Co. Regular dovetailed hive, ½-body size, except sides are ⅝ instead of ⅞, making super ½ inch wider inside. 3 T tins, 4 L tins, 2 side and 2 end followers, 5 separators to each super for 4¼-inch sections, 100 left in flat. $100 takes the lot. Honey flow too scant here for section honey, only two full and one-half crop in 12 years. Might take some white extracted honey on a deal. S. S. Lawing, Ozark, R. D. No. 4, Mo.

AUTOMOBILE REPAIRS

AUTOMOBILE owners should subscribe for the AUTOMOBILE DEALER AND REPAIRER; 150-page illustrated monthly devoted exclusively to the care and repair of the car. The only magazine in the world devoted to the practical side of motoring. The "Trouble Department" contains five pages of numbered questions each month from car owners and repairmen which are answered by experts on gasoline engine repairs. $1.50 per year. 15 cents per copy. Postals not answered. Charles D. Sherman, 107 Highland Court, Hartford, Conn.

WANTS AND EXCHANGES.

WANTED—Second-hand honey storage tank of galvanized steel. H. L. Sherwood, Cornwall, N. Y.

INCUBATORS—¼ price, exchange for extractor, double gun repeater. Lorenzo Clark, Winona, Minn.

WANTED—Full colonies of bees or nuclei. Henry Roorda, 10741 Lafayette Ave., Chicago, Ills.

WANTED—A second-hand four-frame automatic extractor. A. V. Pracher, Willow River, Minn.

WANTED—50 colonies of bees, free from disease. J. R. Simmons, 15540 Turlington Ave., Harvey, Ills.

WANTED—Disease-free bees, beehives, supers, tops, and bottoms. What have you?
Lloyd W. Smith, Madison, N. J.

WANTED—Old combs and cappings for rendering on shares. Our steam equipment secures all the wax. Superior Honey Co, Ogden, Utah.

WANTED—To quote special prices on queen cages in quantity lots, to breeders. State quantity wanted. A. G. Woodman Co., Grand Rapids, Mich.

WANTED—To lease bees on shares with option of buying in Pacific Northwest. E. T. Israel, College Station, Pullman, Wash.

WANTED TO BUY from one to fifty stands of bees. State all in first letter. Parties within radius of 200 miles will have preference.
Chas. A. Fisher, Savoy, Ills.

WANTED—200 or less colonies of bees for spring delivery. Any style hive or box. Remembering 10c honey is in sight for 1921.
A. W. Smith, Birmingham, Mich.

WANTED—200 or more colonies of bees within 100 miles of Flint to work on shares for extracted honey, for season 1921. Address Leonard S. Griggs, 711 Avon St., Flint, Mich.

WANTED—Second-hand honey-extractor, 12-in. pockets; also quantity of ten-frame brood-chambers. All must be in good condition.
Levi Kinney, Ithaca, Mich.

WANTED—To sell or exchange for beekeeping supplies, one set of the Encyclopedia Britannica, genuine India paper, as good as new.
Joe Gates, Hazen, R. D. No. 4. Ark.

WANTED—To correspond with fruit and vine grower having bees that will lease them on shares or go in partnership with me for carload honey production, with very small expenses. M. Hoffman, 69 Center St., Wyandotte, Mich.

BEES WANTED ON SHARES—100 to 200 colonies in southeastern Michigan for season of 1921. Years of experience, County Apiary Inspector. Now own 180 colonies
Earl F. Townsend, 417 Gillespie Ave., Flint, Mich.

WANTED—To exchange a 4 x 5-inch "Premo" film-pack camera and accessories, good as new, for new or used Root "Buckeye" hives in good condition and free from disease. If camera does not appeal to you state spot-cash price on what you have.
James Cockburn, Wellsboro, Pa.

FOR SALE—14 hives of bees, 8-frame, some divisible, mostly new, painted, $10.00 per hive at apiary. Shallow extracting and comb-honey supers, extractor, frames, cheap. Mrs. L. Mueller, Mapledale Farm, Westwood, N. J.

MISCELLANEOUS

SEE our large advertisement on page 243. N. O. Fuller, Medina. O.

FREE sample annual white blossom sweet clover, scarified. Send 2c stamp for postage.
Jas. H. Kitchen, Springfield, R. D. No. 5, Ohio.

FOR SALE—Carneaux pigeons, 50 pairs red and yellow, fine birds, $2.00 a pair.
W. E. Genthner, Saugerties, N. Y.

MAPLE SYRUP—I am now booking orders for pure maple syrup to be delivered in April. Order early. Satisfaction guaranteed.
G. E. Williams, Somerset, R. D. No. 4, Pa.

STRAWBERRY PLANTS—Improved Senator Dunlap, best of all strawberries. Prices on application. McAdams Seed Co., Columbus Grove, Ohio.

FOR SALE—Annual white sweet clover seed from clover 10 to 12 feet high, California grown. Got 111 lbs. left, $5.00 per lb. f. o. b. None better on market, and 3120 lbs. of Willow Celery and alfalfa honey at 15c per lb. in 60-lb. cans, 2 to a case. O. J. Arfsten, Locke, Calif.

BEES AND QUEENS.

FINEST Italian queens. Send for booklet and price list. Jay Smith, R. D. No. 3, Vincennes, Ind.

WHEN it's GOLDEN, it's PHELPS. C. W. Phelps & Son, Binghamton, N. Y.

FOR SALE—Italian queens and nuclei.
B. F. Kindig, E. Lansing, Mich.

HARDY Italian queens, $1.00 each.
W. G. Lauver, Middletown, Pa.

GOLDEN Italian queens, untested, $1.50 each; dozen, $14.00. E. A. Simmons, Greenville, Ala.

FOR SALE—1921 Golden Italian queens, price list free. Write E. E. Lawrence, Doniphan, Mo.

FOR SALE—Bright Italian queens, $1.50 each; $14.00 per doz. Ready after April 15.
T. J. Talley, Greenville, R. D. No. 3, Ala.

NOTICE—We have booked orders for all the bees we will sell this season
Jones & Stevenson, Akers, La.

FOR SALE—1 or 50 colonies of bees in 10-frame Hoffman hives, inspected, $20.00 each, April and May delivery. S. K. Blundin, Oxford Valley, Pa.

FOR SALE—Golden or three-banded virgins, 60c each, or $6.00 per dozen. Safe arrival.
R. O. Cox, Luverne, Ala., R. D. No. 4.

BEES AND QUEENS from my Carolina apiaries —progeny of my famous Porto Rican pedigreed-breeding stock. Elton Warner, Asheville, N. C.

PACKAGE BEES and PURE ITALIAN QUEENS. Booking orders now for spring delivery. Circular free.
J. E. Wing, 155 Schiele Ave., San Jose, Calif.

FOR SALE—Leather-colored Italian queens, tested, until June 1, $2.50; after, $2.00; untested, $1.25; 12, $13.00. Root's goods at Root's prices.
A. W. Yates, 15 Chapman St., Hartford, Conn.

Business-First queens, untested, $1.50 each; select untested, $1.75; tested, $2.25; select tested, $2.50. Safe delivery guaranteed, orders filled promptly. M. F. Perry, Bradentown, Fla.

FOR SALE—A. I. Root Co. strain of leather-colored Italians. Virgins only, May to October 1, 75c; 10, $7.00; 100, $65.00.
P. W. Stowell, Otsego, Mich.

BEES BY THE POUND — Also QUEENS. Booking orders now. FREE circulars give details. See larger ad elsewhere. Nueces County Apiaries, Calallen, Texas. E. B. Ault, Prop.

ORDER booked now for delivery June 1, 3-frame nuclei and queen, $7.50; select tested, $8.50. Dr. Miller's strain. No pound packages. Low express rates and quick transit to north.
S. G. Crocker, Jr., Roland Park, Baltimore, Md.

THREE-BAND AND GOLDEN QUEENS, that produce hustling bees, bred to fill the supers from the finest breeding strains obtainable. Hustlers long-lived and as beautiful in size and color as can be. Price, untested, $1.75; tested, $3.00. Orders filled promptly. Satisfaction guaranteed. Ask for price on large orders. Dr. White Bee Co., Sandia, Texas.

PHELPS' GOLDEN QUEENS will please you. Mated, $2.00. C. W. Phelps & Son, Binghamton, N. Y.

FOR SALE—50 colonies of Italian bees in eight-frame hives. No disease, $6.00 per colony.
Dr. Hugh LeJambre, Bordentown, N. J.

THAGARD'S ITALIAN QUEENS produce workers that fill the supers quick.
V. R. Thagard, Greenville, Ala.

FOR SALE—Farm and 50 colonies of bees with equipment for 100 or more. Good location.
A. L. Weidler, McBain, Mich.

FOR SALE—By Chicago beekeeper, three colonies with supers and other fixtures. Inquire The A. I. Root Co., 230 W. Huron St., Chicago, Ills.

FOR SALE—Hardy Northern-bred Italian queens and bees. Each and every queen warranted satisfactory. For prices and further information, write.
H. G. Quirin, Bellevue, Ohio.

FOR SALE—15 colonies of Italian bees of 10 frames, frames wired and combs built from full sheets of foundation. No disease. H. Shaffer, 2860 Harrison Ave., Cincinnati, Ohio.

FOR SALE—Three-banded Italian queens, untested, $1.50 each; 6, $7.50; 12, $14.00. Select untested, $1.75 each. Satisfaction guaranteed. W. T. Perdue & Sons, R. D. No. 1, Fort Deposit, Ala.

FOR SALE—Three-banded Italian queens, untested, $1.25; tested, $2.00. Ready June 1. Satisfaction guaranteed. Chas. W. Zweily, Willow Springs, Ills.

BY return mail, tested Italian queens, three-banded strain. Only one grade—the best. Safe arrival, satisfaction, and no disease guaranteed.
J. W. K. Shaw & Co., Loreauville, La.

FOR SALE—Golden queens, untested, $1.15; 6 or more, $1.10 each; select untested, $1.60; 6 or more, $1.50 each. Safe arrival. Hazel V. Bonkemeyer, Randleman, R. D. No. 2, N. C.

FOR SALE—Bees for May and June shipment. Two pounds bees and an untested Italian queen shipped by express on drawn comb with stores. Certificate of health with each shipment.
Ross B. Scott, LaGrange, Ind.

STUTT'S Italian queens are supreme queens; ready June 1. Untested, $1.25; 6, $6.50; 12, $12.50. Select untested, $1.50; 6, $8.00; 12, $15.00. Pure mating and safe arrival guaranteed.
Alfred A. Stutt, Lincoln, Ills.

WE believe we have the best Italian queens obtainable. Our new system is working wonders. Book your order now for 1921. Untested, $1.50; tested, $3.00; virgins, imported mothers, 50c.
F. M. Russell, Roxbury, Ohio.

WE are now booking orders for early spring delivery of two and three frame nuclei, with untested or tested queens. Write for prices and terms. We also manufacture cypress hives and frames.
Sarasota Bee Co., Sarasota, Fla.

ITALIAN QUEENS OF WINDMERE are superior three-banded stock. Untested, $1.50 each; 6 for $8.00; tested, $2.50 each; select tested, $3.00. Bees by the pound. Write for prices.
Prof. W. A. Matheny, Ohio University, Athens, O.

DAY-OLD ITALIAN QUEENS—High quality, low price, satisfied customers. Safe arrival guaranteed in U. S. and Canada. Safe introduction. Prices: 1, 75c; 12, $7.20; 100, $60. Write for circular early. James McKee, Riverside, Calif.

1921 price of bees and queens from the A. I. Root Co. leather-colored stock 1 lb. bees with queen, $5.00; 2 lbs. $7.50. Untested queens, $1.50 each; dozen, $15.00. Safe arrival. Orders booked now.
Greenville Bee Co., Greenville, Ala.

IF YOU want queens that will produce results, give THAGARD'S ITALIAN QUEENS a trial.
V. R. Thagard, Greenville, Ala.

MY famous leather-colored Italian queens for May delivery, $2.00 each or six for $11.00. J. W. Romberger, Apiarian, 3113 Locust St., St. Joseph, Mo.

BEES BY THE POUND, also pure-bred QUEENS; booking orders now for delivery after March 15th. Everything guaranteed. Brazos Valley Apiaries, Gause, Texas.

PACKAGE BEES—Two-pound blacks and hybrids, $4.25. Will guarantee 75 per cent safe arrival. Can begin shipping about May 10. One-fourth cash with order. Can supply queens from breeder.
J. M. Berrier, Grandview, Texas.

FOR SALE—30 colonies of bees in 10-frame hives, spaced 9 frames to the hive, shipment to be made about June 1 after they are unpacked. Also write for prices on what you may want in bee supplies. F. J. Rettig, Wabash, Ind.

FOR SALE—2-lb. packages Italian bees and queens by parcel post, postage paid, delivery April 15, for $8.50; 2-frame nuclei with Italian queen by express, not prepaid, delivery May 5, $9.00.
Otto J. Spahn, Pleasantville, N. Y.

IF good three-banded Italian queens are wanted, send your order to M. Bates & Sons, Greenville, R. D. No. 4, Ala. One dozen queens, $14.00; 100, $100. Pure mating, safe arrival, and satisfaction guaranteed.

QUEENS—THE FAMOUS BRENNER strain of three-banded Italians. Equaled only by the best. Untested, $1.50 each; $15.00 per dozen. Tested, $2.50 each. Satisfaction guaranteed.
Dr. A. Wright, Kingsbury, Texas.

FOR SALE—Root's strain of golden and leather-colored Italian queens, bees by the pound and nuclei. Untested, $1.50 each; select untested, $2.00; tested, $2.50 each; select tested, $3.00. For larger lots write. Circular free.
A. J. Pinard, 440 N. 6th St., San Jose, Calif.

SHE-SUITS-ME queens, season of 1921. Untested Italians, $2.00 each, 10 or more, $1.75 each, from May 15 to June 15. After June 15, $1.50 each, up to nine queens; 10 to 24 queens, $1.40 each; 25 and up, $1.25 each.
Allen Latham, Norwichtown, Conn.

FOR SALE—Three-band Italian bees and queens, ready June 1. Fine stock, free from disease and guaranteed to please you. (One grade) select untested queens, $1.50 each; 6, $8.00; 12, $15.00; 50, $60.00. Nuclei, $3.00 per frame, Hoffman; bees, $3.00 per pound. A. E. Crandall, Berlin, Conn.

PHELPS' GOLDEN ITALIAN QUEENS combine the qualities you want. They are GREAT HONEY-GATHERERS, BEAUTIFUL and GENTLE. Virgins, $1.00; mated, $2.00; tested, $5.00. Breeders, $10 to $20. Safe arrival guaranteed only in the U. S. and Canada.
C. W. Phelps & Son, Binghamton, N. Y.

TWO-FRAME NUCLEI with untested Italian queens from the apiary of E. R. King, formerly inspector in Ohio and later in charge of Apiculture at Cornell University. No disease in territory. May delivery, $7.50; June, $6.50; July, $5.00. 50 per cent cash with order. If queen is not wanted, deduct $1.25 from above prices:
Miss E. J. King, McArthur, Ohio.

FOR SALE—Honey-Brook Farm can supply you promptly, beginning April 10, with the very best three-banded Italian queens, one grade, select untested, $1.50 each, or $15 per dozen; tested, $2.00 each straight; ready April 1. Should you find some queenless colonies this spring, send me your order for a young queen to save them. I will not disappoint you. I have the bees and can deliver the goods. Pure mating, safe arrival, and satisfaction guaranteed. Jasper Knight, Hayneville, Ala.

BEES from my Italian queens would not excel at an exhibit, but they are hard to beat any place else. Circular tells more about them. R. V. Stearns, Brady, Texas.

ITALIAN QUEENS—We will have a limited number of our "Riverside" queens for sale this season. These are the product of years of skillful breeding. Write for prices.
Riverside Apiaries, Caryville, Fla.

"QUEENS, QUALITY FIRST QUEENS." High-grade, pure, three-banded and golden Italians. These queens are as good as can be bought; are gentle, prolific, and good honey-gatherers. I guarantee safe arrival and satisfaction. Why not try these and be convinced? Untested, $1.25 each; 6, $6.50; 12, $12.50. Selected untested, $1.50; 6, $8.00.
G. H. Merrill, Pickens, S. C.

"BEES, APRIL SHIPMENT," 15th to May 1st. Two pounds bees on a standard frame with brood and honey, $4.75; three pounds, $6.15. No disease and safe arrival guaranteed. Orders booked in rotation. Please order from advertisement. Address with remittance. No queens shipped with April bees. L. C. Mayeux, Box 4, Hamburg, La.

FOR SALE—Pure Italian queens, Golden or leather-colored, packages and nuclei; 1 untested queen, $1.50; 6, $7.50; 12, $13.50; 50, $55.00; 100, $100; virgins, 50c each; packages 24 and under, $2.25 per pound; 25 and over, $2.00 per pound; nuclei, 1-frame, $4.00; 2-frame, $6.00; 3-frame, $7.50; queens extra. One-story 10-frame colony with queens, $12.00. Golden Star Apiaries, R. 3, Box 166, Chico, Calif.

FOR SPRING DELIVERY—One good Italian queen, 1 Hoffman standard frame emerging brood. 1 pound live bees, price complete, $6.50, f. o. b. Bordelonville. Queen introduced, mated, laying en route; loss in transit replaced if noted on express tag by agent; no disease in State. References given. Orders booked, May delivery, one-fifth cash; orders filled in rotation. Jess Dalton, Bordelonville, La.

FOR SALE—30 colonies of bees in 8-frame brood-chamber and 6 frames in supers 4¼ x 4¼. Langstroth hives, pine, dovetailed. Will pack and deliver to express company in Shawneetown and guarantee to destination, for $6.00 per colony. Will ship from 1st to 15th May. The bees are in Shawneetown, Ills. Will not sell less than 5-colony lots. Address me up to May 1, Fort Lauderdale, Fla.
R. Cadle, Fort Lauderdale, Fla.

QUEENS—Three-banded Italians only. Now that the booking season for nuclei has passed, and, while I have a large number of orders for nuclei, I shall not be too busy with these to fill your orders for queens. 1 untested for April, $1.25; 12, $12.50; 1 untested for May 1 to June 1, $1.00; 12, $10.00. I ship no queens after June 1; weather is too hot. Discount on large orders. Safe arrival guaranteed.
L. R. Dockery, Carrizo Springs, Texas.

FOR SALE—1921 prices on nuclei and queens, 1-frame nucleus, $3.00; 2-frame nucleus, $5.00; 3-frame nucleus, $6.50, without queens, f. o. b. Macon, Miss. 5 per cent discount in lots of 25 or more. Untested queens, $1.50 each; $15.00 per dozen; tested, $2.00 each; $22.00 per dozen. No disease. Inspection certificate with each shipment. Safe arrival and satisfaction guaranteed in U. S. Queens sold only with nuclei.
Geo. A. Hummer & Sons., Prairie Point, Miss.

WE want to please you; our reliable three-banded queens and bees will be ready May 1. All bees are shipped on a standard frame of brood and honey. 1-lb. package bees, no queen, $3.25; 2-lb., $4.50; 3-lb., $5.75. One-frame nuclei, no queen, $2.75; 2-frame, $4.00. Queens untested, each, $1.50. A few hybrid bees from outyards; but remember, all queens are reared from our home queen yard. Safe delivery guaranteed; also free from disease of any kind; 25 per cent with order, balance 10 days before shipping date. A few selected tested queens at $2.50 each. Oscar Mayeux, Lock Box No. 15, Hamburg, Louisiana.

FOR SALE—Pure Italian queens and nuclei, 1 untested queen, $1.50; 12, $15.00; tested queens, $2.50 each; 2-frame nucleus, $5.00; 3-frame nucleus, $6.50. Add price of queen wanted to price of nucleus.
Frank Bornhoffer, R. D. No. 17, Mt. Washington, O.

FOR SALE—Three-band leather-colored Italian bees and queens, two-pound packages only. Shipping season, April 15 to May 25. Safe arrival and satisfaction guaranteed. No disease. Two-pound package, $5.00; untested queen, $1.50; select untested, $2.00; tested, $2.50; select tested, $3.00. Circular on request. J. M. Cutts, R. No. 1, Montgomery, Ala.

ITALIAN BEES for May delivery. Safe delivery and no disease guaranteed. We want to please you. Bees shipped on comb of stores in Standard Hoffman frame. 3-lb. pkgs. with untested queen, $7.00; 3-lb. pkgs. with tested queen, $8.00; two-frame nuclei with untested queen, $6.50; three-frame nuclei with untested queen, $8.00. 50 per cent books your order. Balance 30 days before date of shipment. J. L. St. Romain, White Clover Farm and Apiary, Hamburg, La.

IF you think PHELPS' GOLDEN QUEENS are BEAUTIFUL, GENTLE, and just what you want to IMPROVE YOUR STOCK, we will do our best to supply you if you will give us time to fill your order in its turn. Mated (untested), $2.00 each; virgins, $1.00 each; tested, $5.00 each; select breeders, $10.00 to $20.00 each. We will commence sending queens just as early as weather will permit us to rear good ones. C. W. Phelps & Son, 3 Wilcox St., Binghamton, N. Y.

PRITCHARD QUEENS (Three-banded Italians) —My first season selling direct to the trade. June price: 1 untested, $1.75; 6 for $9.50; 1 select untested, $2.00; 6 for $11.00. After July 1: 1 untested, $1.50; 6 for $8.00; 1 select untested, $1.75; 6 for $9.50. Write for prices on larger quantities. I have a few extra-select tested queens one year old at $5.00 each. Queens clipped free of charge on request. Acknowledgment and directions for introducing sent on receipt of order. Safe delivery and satisfaction guaranteed. Let me book your order now for early delivery, specifying the date of shipment desired. Otherwise orders will be filled in rotation. Arlie Pritchard, Medina, Ohio.

HELP WANTED.

WANTED—A reliable man with some beekeeping experience to help in my bee business. Begin work about April 15. H. B. Gable, Romulus, N. Y.

WANTED—Young man of good habits, to work with bees, some experience necessary. Room and board furnished. State all particulars in first letter.
B. B. Coggshall, Groton, N. Y.

WANTED for the season of 1921 an experienced queen-breeder. State experience had, reference, age, height, weight.
W. J. Forehand & Sons, Ft. Deposit, Ala.

WANTED—A willing and reliable young man of good habits to help in our 13 apiaries and apple orchard. State age, weight, height, and wages expected in first letter. We have 700 colonies. A good chance to learn commercial beekeeping.
Harry W. Beaver, Troy, Pa.

WANTED—One experienced man, and students or helpers, in our large bee business; good chance to learn. Modern equipment and outfit, including auto truck; located near summer resorts. Write giving age, height, weight, experience, reference, and wages wanted. W. A. Latshaw Co., Clarion, Mich.

WANTED—Two young men, able-bodied, willing to work, clean in body and mind, who want to learn beekeeping and are willing to exchange faithful services for instruction from a man with almost 40 years of extensive experience in beekeeping, board and some financial remuneration. Have 12 apiaries. R. F. Holtermann, Brantford, Ont., Can.

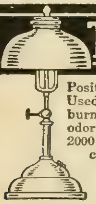
WANTED—One experienced man and students, clean habits, able-bodied and willing workers, as helpers with our more than 1000 colonies. Opportunity to learn the business from A to Z, 1920 crop 122,000 pounds. Theory also. Write immediately, giving age, height, weight, habits, former employment, experience, references, wages, photo, all in first letter. E. F. Atwater (former Special Field Agent in Beekeeping, U. S. Dept. Agr.), Meridian, Idaho.

SITUATIONS WANTED

WANTED—A chance to learn beekeeping in a modern apiary in Minnesota
L. A. Tessmer, Rockford, Minn.

WANTED—Work in a bee yard as helper. State what wages will be paid.
C. Prescher, 143 Bowery St., New York, N. Y.

YOUNG man with experience in fruit growing with beekeeping as side line, wants position in modern apiary to learn business. Small salary would be satisfactory while learning.
Hubert R. West, Albion, Nebr.



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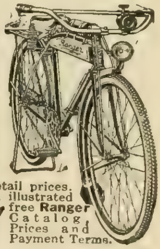

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STRAWBERRIES

(Summer and Fall-Bearing and all Small Fruit Plants)

Strawberries and all Small Fruit Plants mean big and *quick* profits for you at small outlay of money. We are headquarters for Summer and Fall Bearing Strawberry Plants, Raspberries, Blackberries, Gooseberries, Currants, Grapes, Fruit Trees, Roses, Shrubs, Eggs for Hatching, Crates, Baskets, Seed Potatoes, Asparagus, etc. Best varieties, lowest price, 38 years' experience.

Our free catalogue is brimfull of valuable information. Be sure to send for it. Write today.

L. J. Farmer, Box 108, Pulaski, New York

World's Best Roofing at Factory Prices

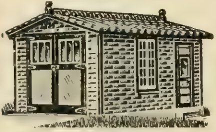
"Reo" Cluster Metal Shingles, V-Crimp, Corrugated, Standing Seam, Painted or Galvanized Roofings, Sidings, Wallboard, Paints, etc., direct to you at Rock-Bottom Factory Prices. Positively greatest offer ever made.

Edwards "Reo" Metal Shingles

cost less; outlast three ordinary roofs. No painting or repairs. Guaranteed rot, fire, rust, lightning proof.

Free Roofing Book

Get our wonderfully low prices and free samples. We sell direct to you and save you all in-between dealer's profits. Ask for Book No. 183



LOW PRICED GARAGES

Lowest prices on Ready-Made Fire-Proof Steel Garages. Set up any place. Send postal for Garage Book, showing styles.

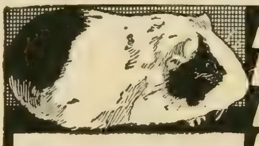
THE EDWARDS MFG. CO.,
433-483 **Pike St., Cincinnati, O.**

FREE
Samples &
Roofing Book

GOOD SEEDS

Grown From Select Stock
—NONE BETTER—50 years selling seeds. Prices below all others. Buy and test. If not O. K. return and I will refund. Extra packets sent free in all orders I fill. Send address for **BIG CATALOGUE,** illustrated with over 700 pictures of vegetables and flowers of every variety.

R. H. SHUMWAY,
ROCKFORD, ILL.



Raise Guinea PIGS- FOR US!

We need men and women, boys and girls everywhere to raise Guinea Pigs for us. We tell you where to get them, show you how and buy all you raise. Big opportunity for money making. Thousands needed weekly.

Easy to Raise—Big Demand No special knowledge, **Large Profits** experience or equipment needed. They breed the year round—are very prolific—require but little space or attention. Pay better than poultry or squabs—cost less to house, feed, keep, easier raised—less trouble, market guaranteed. **Particulars, contract, and booklet how to raise FREE**

CAVIES DISTRIBUTING COMPANY
3145 Grand Avenue, Kansas City, Mo.
Largest Guinea Pig breeders and distributors in America.

QUEENS

Gentle three-band Italians. Untested $1.25. Select untested $1.50. Send your order now for April and May delivery. Your honey crop depends on good queens. I guarantee mating and quality.

D. W. HOWELL
Shellman, Georgia

Our Food Page.—Continued from Page 221

way, can remember when there was no town on this site. He came here with his father exactly 70 years ago, and his reminiscences were very interesting.

The following menu gives little idea of the luncheon, which was perfectly cooked and served:

MENU.
Relish
Queen Olives
Soup
Light Amber Extracted in Alexander Feeders
Fish
Three-banded Striped Bass
Meat
Chicken, Select Tested
Dessert
Apple Pie, Bevel Cover
Coffee
Dark Amber
Cheese
American European

Singing by Queens, Workers, and Drones.

The San Francisco and Oakland papers gave much space to reports of the meetings. In the Sunday San Francisco Chronicle appeared a cartoon of the Oakland City Hall, with a swarm of bees approaching and hovering around it, said bees on close inspection proving to be winged men carrying traveling bags. On one side of the tower was "It was Honey Week," and on the other side, "California State Beekeepers' Association swarmed into Oakland—no record of anyone getting stung."

Extracted Honey We Sell It! Write for Prices
C. C. Clemons Produce Co.
132 Grand Avenue
KANSAS CITY, MISSOURI

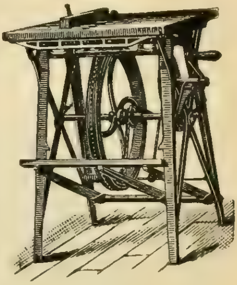
Queens

Write for our catalog of high-grade Italian Queens. Pure mating and safe arrival guaranteed.

Prices for 1921.

1 to 4 inclusive $3.00 ea.
5 to 9 inclusive 2.90 ea.
10 or more... 2.80 ea.
Breeders .... 12.00 ea.

Jay Smith
Route Three
Vincennes, Indiana.



BARNES' Hand and Foot Power Machinery

This cut represents our combined circular saw, which is made for beekeepers' use in the construction of their hives, sections, etc.

Machines on Trial

Send for illustrated catalog and prices.

W. F. & JOHN BARNES CO
545 Ruby Street
ROCKFORD, ILLINOIS

EVERBEARING STRAWBERRIES

Our selection best varieties for home and market—100 plants postpaid, $2.50; 200 $4.25; 300 $6.00.
Home of the Everbears.
Introducers of Progressive.
Best up-to-date standard varieties (not everbearing, our selection), 100 plants postpaid, $1.25; 200 $2.10; 300 $2.95. Catalog free.
C. N. Flansburgh & Son - Jackson, Mich.

"For Lovers of Art Needle Work"
The Wonder Embroidery Needle

It is easy to embroider the AUTOBROIDER WAY. So simple a Child Can Operate It.

THIS WONDERFUL NEW INVENTION enables you to do the most beautiful hand embroidery in very short time, and so easily that no skill is needed.

Makes all stitches alike and is self-feeding. You can embroider Dresses, Scarfs, Pillow Tops, Center Pieces, Children's Clothes, in fact, everything that should be embroidered.

Ten times as fast and at half the cost of the old way. You can also make beautiful velvet-effect rugs. The most "HUMAN NEEDLE" ever produced to be worked by hand.

Price of Needle complete with instructions, skein of yarn, pillow top and back for $1.50 prepaid.

Send Money Order, Check, or Currency in place of stamps when possible.

N. O. FULLER - - - - - MEDINA, OHIO

Buy Your Bee Supplies Now

Take advantage of early-order discounts by ordering NOW. We guarantee to please you. "Prompt service and the very best" is our motto. *We want your beeswax and old comb.* Highest cash and trade prices offered. Texas beekeepers should write A. M. HUNT, Goldthwaite, Texas.

Manufactured by

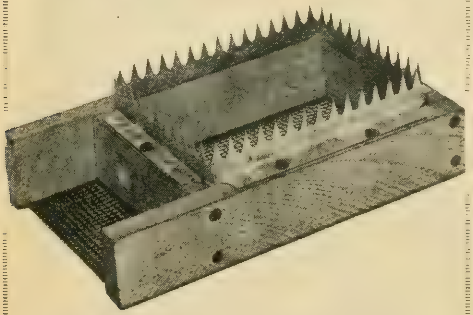
Leahy Manufacturing Company

95 Sixth St., Higginsville, Missouri.

Write for FREE catalog. It is to your interest.

Stop Losing Valuable Queens!

This can be done by the use of the Jay Smith Push-in-the-Comb introducing cage. This cage has been thoroughly tested, and will give very satisfactory results. For complete information on this cage, see pages 498 to 500. August, 1919, "Gleanings in Bee Culture." Price complete, 75 cents each; ten, $7.00; one hundred, $60.00.

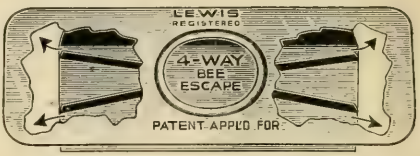


The A. I. Root Company

West Side Station

MEDINA OHIO

LEWIS 4-WAY BEE ESCAPES



Four exits from supers. Fits all standard boards. Springs of coppered steel. Made of substantial metal. Made by

G. B. Lewis Company, Watertown, Wis., U.S.A.

Sold only by Lewis "Beeware" Distributors.

Established 1885.

Write us for catalog.

ALWAYS ON TOP

BEEKEEPERS' SUPPLIES

The Kind You Want and the Kind That Bees Need.

We have a good assortment in stock of bee supplies that are mostly needed in every apiary. The A. I. Root Co.'s brand. Let us hear from you; information given to all inquiries. Beeswax wanted for supplies or cash.

John Nebel & Son Supply Co.

High Hill, Montgomery Co., Mo.

SPECIAL CROPS

$10,000.00 per acre every 5 years.

A high grade monthly devoted to growing MEDICINAL plants. $1.00 per year, sample copy ten cents.

HYBRID POTATO SEED. Something new. Every seed will give you new variety of potato. You will get all shapes and all colors. Some better than old standard sorts and some not as good. Package of this seed 25 cts. Potato seed and new subscription both for $1.00. Address

SPECIAL CROPS PUB. CO.

Box G, Skaneateles, N. Y.

BANKING BY MAIL AT 4%

YOUR CHANCE IN LIFE

is of your own making rather than of your taking. Your Savings Account may—WILL—be the making of your chance. MAIL your Savings deposits to this institution.

THE SAVINGS DEPOSIT BANK CO.

A. T. SPITZER, Pres.
E. R. ROOT, Vice Pres. E. B. SPITZER, Cash.

MEDINA, OHIO

FOR SALE

Three-banded Italian Bees and Queens after April 15th.	1	12
Untested Queens	$1.75	$15.00
Select Untested Queens	2.25	20.00
Tested Queens	2.75	28.00
Select Tested Queens	3.25	33.00

Breeders $5.00 to $10.00 at all times. A limited amount of one and two frame Nuclei. Prices on request.

H. L. MURRY
SOSO, MISS.

NEWMAN'S ITALIAN QUEENS

Bred From the Best. Absolutely First Quality and fully guaranteed. No disease. Satisfaction and safe arrival. Untested, $1.50; 6, $8.00; 12, $15.00. Select Untested, $2.00; 6, $10.00. 12, $19.00. Circular free.

A. H. NEWMAN, Queen Breeder
MORGAN, KY.

QUEENS and BEES
WHEN YOU WANT THEM

We are establishing one of the most modern Queen-rearing outfits in the United States, and will breed from New Imported Italian Blood. We are not going to tell you how many Queens we will put on the market, as we shall produce QUALITY instead of QUANTITY.

A limited number of orders for spring delivery will be accepted at the following prices:

Quantity	1	6	12	24
Untested	$2.00	$11.40	$21.60	$40.80
Sel. Untested	2.25	12.80	24.30	45.90

We are also prepared to furnish full colonies, nuclei, and pound packages for spring delivery. Write today for prices.

THE A. I. ROOT COMPANY
OF TEXAS
P. O. Box 765, SAN ANTONIO, TEX.

Pure Italian Queens of the Best Known Strain

Booking orders now for spring delivery of two-frame nuclei, two-pound packages and full colonies. A. I. Root and H. D. Murry three-banded stock

Prices:	1	12
Untested	$1.50	$14.50
Tested	2.25	24.00
Select Tested	3.00	30.00

Two-frame nuclei with untested queens, $6.00; twenty-five or more, $5.50. Two-frame nuclei with tested queens, $6.75; twenty-five or more, $6.25. Two-pound packages hybrid bees, each $4.00; add price of queens wanted. No disease near here; health certificate with all I have for sale. Safe arrival and satisfaction guaranteed. Terms: One-fourth with order; balance due at shipping time.

Baughn Stone
Manchester, Texas.

THE OLD RELIABLE
THREE-BANDED ITALIANS

Booking orders now for 1921. Queens ready April 1st My Italians are of an exceptionally vigorous and long-lived stock strain of bees. They are gentle, prolific, very resistant to foul brood, and the best of honey-gatherers. I have sold a good many queens to parties who are using them in stamping out foul brood. Orders booked for one-fourth cash, balance before delivery. Will guarantee safe arrival in the United States and Canada. Descriptive circular and price list free.

	Prices April, May, and June			July to November		
	1	6	12	1	6	12
Untested	$1.50	$8.00	$15.00	$1.25	$6.50	$12.50
Select Untested	1.75	9.00	16.00	1.50	8.00	15.00
Tested	2.50	12.50	24.00	2.25	12.00	22.00
Select Tested	3.00 each			3.00 each		

No nuclei or pound packages of bees for sale.

John G. Miller, 723 C St., Corpus Christi, Tex.

Write for Book Today

FARM WAGONS

High or low wheels—steel or wood—wide or narrow tires. Steel or wood wheels to fit any running gear. Wagon parts of all kinds. Write today for free catalog illustrated in colors.

ELECTRIC WHEEL CO., 23 Elm Street, Quincy, Ill.

TINS AND GLASS JARS Down in Cost---Order Now for Next Crop Packing. Note Low Prices Subject to Change at Any Date.

2½-lb. Cans.	
2 dozen reshipping cases	$1.45 per case net
In 100-can crates	$6.50 per crate net
In 200-can crates	$11.00 per crate net
In 500-can crates	$24.50 per crate net

5-lb. Pails with Handles:	
1 Doz. reshpg. cases	$1.35 per case net
In Crates of 100	$8.30 per crate net
In Crates of 200	$16.25 per crate net

10-lb. Pails with Handles.	
In ½ Doz. cases	$1.10 per case net
In crates of 50	$6.70 per crate net
In crates of 100	$12.75 per crate net
5-Gal tins, used, good condition, 2 to case	50c per case
5-Gal. tins, NEW, 2 tins to wood case	$1.35 per case

WHITE FLINT GLASS, WITH GOLD LACQD. WAX-LINED CAPS.	
8-oz. Honey Capacity, Cylinder style	$1.50 carton of 3 doz.
16-oz. Honey Capacity, Table Jar style	$1.40 carton of 2 doz.
Quart or 3-lb. Honey Capacity, Mason Style	$1.00 carton of 1 doz.

HOFFMAN & HAUCK, INC. - - Woodhaven, New York

"Falcon"

Bees and Bee Supplies

RECOMMENDED cheerfully because used successfully by leading beemen for over 40 years. Safe arrival of shipments guaranteed. Order NOW.

Send for our red Catalog.

Distributor for the Central West:
William H. Rodman, 2027 Main St., Gateway Sta., Kansas City, Mo.

W. T. Falconer Mfg. Co., Falconer, N. Y.

"where the best beehives come from."

Honey Producers, Take Notice

Do you realize it is only a short time until your bees will be taken out of winter quarters? Have you thought about supplies for next season? Do not wait until swarming time for that means dollars out of your pocket. Order your supplies NOW.

We manufacture and carry in stock a complete line of Bee Supplies ready for prompt shipment. Send us a list of the supplies you wish to purchase and we will be pleased to quote you our prices. Our 1921 descriptive catalog and price list is now ready for mailing. Send us your name and address and we will mail it to you.

August Lotz Company, Boyd, Wisconsin

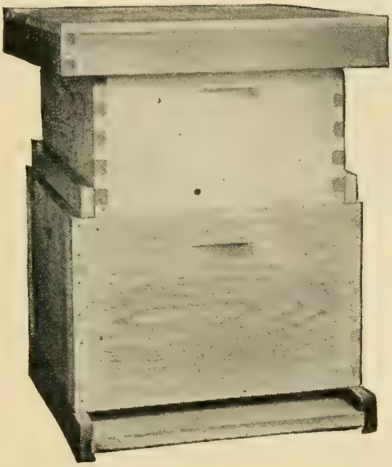
Modified Dadant Hive

Your present brood equipment can be put above the Modified Dadant hive used as full depth supers.

Features are: Deep frames, large one-story brood nest, frame space ventilation, excellence in wintering, swarming easily controlled.

Glance at this illustration to compare this hive with "Standard" Langstroth hive.

You can get 40 per cent greater brood-comb area than in the "Standard" ten-frame Langstroth.



Modified Dadant Hive Features.

1. Eleven frames, Langstroth length, Quinby depth.
2. Frames spaced 1½ inches for swarm control.
3. Extracting frames 6¼ inches deep.
4. Dovetailed body, regular reversible bottom and metal roof cover with inner cover.
5. Langstroth "Standard" equipment easily used with this hive.

For free booklet write any distributor of Lewis "Beeware," or to

G. B. Lewis Company - - - - - - Watertown, Wisconsin
Dadant & Sons - - - - - - - - - - Hamilton, Illinois

Thagard's Italian Queens

Bred for Quality

My three-banded queens are bred from imported stock; they are hardy, prolific, gentle, disease-resisting, and honey producers. A good queen is the life of any colony; head your colony with some of our queens, place our queens against any queen you may obtain anywhere, and note the results. Book your order now for the latter part of April and May delivery.

	April 1st to July 1st. 1	6	12
Untested	$2.00	$8.00	$15.00
Select Untested	2.25	10.00	18.00
Tested	3.00	16.00	28.00
Select Tested	5.00	25.00	50.00

Safe arrival, pure mating, and perfect satisfaction guarteed. Circular free.

V. R. Thagard
Greenville, Ala.

"Best" Hand Lantern

A powerful portable lamp, giving a 300 candle power pure white light. Just what the farmer, dairyman, stockman, etc. needs. Safe—Reliable—Economical—Absolutely Rain, Storm and Bug proof. Burns either gasoline or kerosene. Light in weight. **Agents wanted. Big Profits. Write for Catalog.** THE BEST LIGHT CO.
306 E. 5th St., Canton, O.

INDIANOLA APIARY

will furnish 3-banded Italian bees and queens: Untested queens, $1.00 each; tested, $1.50 each. One pound bees, no queen, $2.00. No disease.

J.W.SHERMAN,VALDOSTA,GA.

NEW ENGLAND

BEEKEEPERS will find a complete stock of up-to-date supplies here. Remember we are in the shipping center of New England. If you do not have a 1921 catalog send for one at once.

H. H. Jepson, 182 Friend St., Boston 14, Mass.

ROOT'S BEE SUPPLIES.

I can make immediate shipment for early orders, and you can get the discount by ordering early.

A. M. MOORE, Zanesville, Ohio.
22½ South 3rd St.

Completely Destroys the Weed Growth

More than that, the BARKER breaks the hardest crust into a level, porous, moisture-retaining mulch—**all in the same operation.**

A ten-year-old boy can run it—do mor and better work than ten men with hoes Saves time and labor, the two big expense items.

BARKER WEEDER, MULCHE AND CULTIVATO

Eight reel blades revolve against a stationar underground knife — like a lawn mowe Best Weed Killer Ever Used." Works right up t plants. Cuts runners. Aerates the soil. Ha leaf guards, and shovels for deeper cultivation—3 *garden tools in* 1.

FREE ILLUSTRATED BOOK.

Tells how gardeners and fruit-growers everywhere are reducing their work; increasing thei yields.—How to bring growing plants throug a dry season.—How to conserve the moisture and force a larger, more rapid growth. Send TODAY for this free, illustrated book and special Factory-to-User offer.

BARKER MANUFACTURING COMPANY

Dept. 23. David City, Ne

Barker Mfg. Co., Dept. 23, David City, Neb.
Gentlemen:—Send me postpaid your free book and Factory-to-User offer.

Name........................

Town ....

State ....

R. F. D. or Box......

Two Thousand Nuclei For Spring Delivery

A great many progressive beekeepers of today buy nuclei to make up winter losses, or in the form of pound packages to strengthen weak colonies. We know this is a good investment, and for a good many years have raised bees in the South, sending them north to catch the honey flow in July and August. It is our policy, in furnishing our customers with bees from our southern apiaries, to furnish bees that give satisfaction to you, as they have to us for the past ten years. We are very particular as to the strain of bees we keep, and the rearing of our queens is in the hands of an expert.

We maintain that the queen is the life of the colony, and they are reared under the most favorable conditions, that of natural swarming, and they are fine large ones with energy to spare, and as good as money can buy. However, we do not sell queens, but we see that a good queen goes with every nucleus we sell. We guarantee you safety against disease, as our bees are inspected constantly, and our apiaries closely watched to see that no disease appears. Our prices as follows:

	April	May	June
1-frame nucleus	$4.00	$3.50	$3.00
2-frame nucleus	5.50	5.00	4.50
3-frame nucleus	7.00	6.50	6.00
4-frame nucleus	9.00	8.50	8.00

Full colonies of bees, $12.00 per colony

1-pound package	$2.50
2-pound package	4.50
3-pound package	6.50

For packages with queens add $1.50 for each package.

**WEBER BROS.
HONEY CO.
RIALTO, CALIFORNIA**

Quality Bee Supplies From a Reliable House

¶ Without fear or favor I place my BEE SUPPLIES and SERVICE before you.

¶ It is the small annoyances that often grow into disastrous results. Avoid the so-called "little losses" by using MONDENG'S goods. Quality is first—save time when you put your goods together by getting supplies that are accurately made. Service is next—no delays when bee supplies are ordered from my factory.

¶ I am ready to meet your urgent needs. Send for my latest price-list.

¶ Closing out all Langstroth and Wisconsin hives and supers. Also Langstroth triangular top-bar frames, and eight-frame D. T. supers for 4 x 5 sections. At cost price, write for quotations.

Charles Mondeng
146 Newton Ave. N. &
159 Cedar Lake Road.
MINNEAPOLIS, MINNESOTA.

Beeswax Wanted

In big and small shipments, to keep Buck's Weed-process foundation factory going. We have greatly increased the capacity of our plant. We are paying higher prices than ever for wax. We work wax for cash or on shares.

Root Bee Supplies

Big stock, wholesale and retail. Big catalog free.

Carl F. Buck
The Comb-foundation Specialist
August, Kansas
Established 1899.

BEE SUPPLIES

We are prepared to give you value for your money. Our factory is well equipped with the best machinery to manufacture the very best bee supplies that money can buy. Only the choicest material suitable for beehives is used. Our workmanship is the very best. Get our prices and save money.

EGGERS BEE SUPPLY MFG. COMPANY, INC.
Eau Claire, Wis.

EVERY SHEET THE SAME

As alike as peas in a pod—only more so. That is a distinguishing feature of my comb foundation. Accuracy is my watchword. My foundation is not left with the natural milled edge, but every edge is trimmed with an absolutely straight, smooth cut, and always measures right to the dot, no matter what the size ordered.

This accurate trimming not only expedites placing the foundation in the frames, but also permits of such close packing for shipment that there is no chance for it to chuck around, thus jamming the edges.

Although this extra trimming adds to the cost of manufacture, still my prices are lower than others.

Your own wax worked into foundation at lowest rates. Send for complete price list.

E. S. Robinson
Mayville, Chautauqua Co., N. Y.

Forehand's Queens

They Satisfy---Why?

Because of 28 years of experimental work, with both queen-breeding and honey-production. With breeding and selecting of imported queens, I have reached a standard which is ideal. Queens as good, but none BETTER. Why experiment? Take advantage of the life experience of my breeders.

OUR SERVICE STATION—We are ready to serve you at all times, whether you desire queens or advice. Let us help you with your bee problems. All questions are cheerfully answered.

I breed three-banded Italians only. Nov. 1st to June 1st.

	1	6	12
Untested	$2.00	$ 9.00	$16.00
Selected Untested	2.25	10.50	18.00
Tested	3.00	16.50	30.00
Selected Tested	3.50	19.50	36.00

Bees in two-pound packages, 1 package, $6.00; 25 or over, $5.80; 50 or over $5.40; 100 or over, $5.00, without queens. Will begin shipping bees as early as weather will permit.

Orders booked now for spring delivery. One-fourth the full amount with order and balance when shipment is desired. Pure mating, safe arrival, and perfect satisfaction guaranteed. Write for circulars and large-order discounts. Foreign orders at receiver's risk.

N. Forehand, Ramer, Alabama

QUEENS AND BEES

Mr. Beekeeper, we are establishing one of the most modern queen-rearing outfits in the U. S. A. If you want good quality, quick service, prompt attention, and perfect satisfaction, don't fail to place your orders with us on time as we fill orders in rotation. Our queens are bred by experienced queen-breeders; they are reared by the latest and most approved method and from the very best honey-gathering strain of Italians obtainable. Our experience from boyhood up under our father (who had fifty years of experience with bees) thus enables us to produce queens as good as can be produced, but none better, and we sell at figures that will sustain the high quality of our queens. Our bees are hardy, gentle, prolific, disease-resistant and honey-gatherers. Each and every queen that leaves our yard is inspected by us personally and all inferior ones are killed.

Prices April, May, and June:	1	6	12	100
Untested Queens	$1.50	$ 8.00	$15.00	$100.00
Select Untested Queens	1.75	9.25	16.50	115.00
Tested Queens	2.75	13.75	24.50	
Select Tested Queens	3.50 each			

— BEES —

We ship only 2-lb. packages by express F. O. B. shipping point, $5.00 each; 25 or more, $4.75 each. Add prices of queens wanted. We guarantee pure mating, safe arrival, and free from all diseases in U. S. A. and Canada. Remember you take no risk when you deal with us. Isn't that enough said? Reference, Bank of Ramer, Ramer, Ala.

The Norman Brothers Apiaries

Naftel, Alabama

ITALIAN BEES & QUEENS OF PURE THREE-BAND STOCK

Bred from best hustlers, by methods that years of experience has taught us are best, including the use of large, strong nuclei, which insures young queens emerging strong and vigorous. Safe arival in U. S. and Canada. Health certificate with each shipment. Satisfaction guaranteed.

Untested	1 to 12, $1.50 each.	Over 12, $1.25 each
Select Untested	1 to 12, $1.75 each.	Over 12, $1.50 each
Tested	1 to 12, $2.50 each.	Over 12, $2.25 each
Select Tested, suitable for breeders		$5.00 each

Two-frame nuclei, $5.00. Three-frame nuclei, $7.00; add price of queen wanted with each. Eight-frame colony, $15.00. Ten-frame colony, $17.50. Standard equipment all around, and wired frames.

JENSEN'S APIARIES, CRAWFORD, MISS., R. F. D. No. 3.

This photograph shows four types of clover which were seeded with spring wheat. The wheat was cut off and the clover allowed to grow until September when it was cut. At the extreme right is ordinary red clover, next is yellow biennial sweet clover, next is white biennial sweet clover, and in the center is the white annual sweet clover whose seed we offer you. This shows how rapidly this legume grows.

THE GREATEST CLOVER FOR BEES!

This Annual White Sweet Clover blooms for bees in three or four months and continues to bloom for a much longer period than most plants used for the purpose. Many beekeepers have used it and say that it is the greatest clover yet tried. Quick growth, and a great wealth of honey-making blooms.

This is the clover that was discovered by Prof. Hughes of the Iowa State Agricultural Experimental Station at Ames, Iowa, and has frequently been described in the editorial columns of this publication. It matures in a single year, so that blossoms for bees, hay or seed may be had in one season. It provides quickly a rank growth for plowing under. Now for $1 you can try out this seed on your farm under your own conditions and see what it will do. For $1 you can learn the facts about this new and better clover for bees.

We have a quantity of the seed and will sell a trial package of 14,000 seeds for $1—enough to test it out thoroughly. The package is sealed and guaranteed pure annual sweet clover seed of the Hughes variety. It should produce half a bushel of seed if you take care of the crop properly. Inquiry is solicited for larger amounts.

Pin $1 bill to this advertisement. Attach your name and address. The package of seed and the booklet explaining the whole proposition will be sent you by return mail.

We are growers of Selected Evergreen Sweet Corn and Perfection Alaska and Perfection Garden Wrinkled Peas. They are high quality with an especially high germination test.

THE DE GRAFF FOOD COMPANY, De Graff, Ohio

WHY QUALITY COUNTS

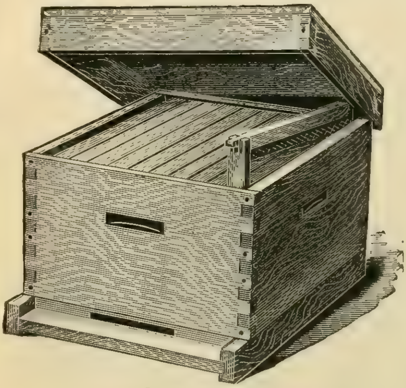
Metal Covers

1. Double cover of metal and wood, absolutely rainproof and cannot warp.

2. Air space between metal and wood makes the poorest known conductor of heat, thus helping to make the hive cool in summer, and warm in winter.

3. Will last a lifetime if properly cared for.

4. Does not easily blow off in a wind—sticks like glue to the hive.



Hive Body

1. Full 25/32 White Pine, free from knots, perfectly dried and carefully cut and milled.

2. Lock corner of ½ inch at top and bottom, preventing splitting and contributing to the strength of the body.

3. Light weight, yet strong and durable.

Reversible Bottom

1. Made of strong heavy cypress, which will not rot.

2. Matched, tongued and grooved with grain crossed, fitted into strong end cleats, which prevents warping.

3. Reversible ⅜-inch bee space for winter; ⅞-inch for summer.

4. Automatic entrance cleats, providing a small entrance for winter, medium for spring and fall, which can be removed entirely in summer.

All of these points of quality are to be found in a Root Hive. That's

Why Root Hives Pay.

THE A. I. ROOT CO. OF IOWA.

Council Bluffs, Iowa

Hives from the Wood Eternal

FULL 7/8 INCH THICK.

$16.00 for five complete. Send for catalogue.

ITALIAN BEES AND QUEENS

Three-banded ITALIAN QUEENS reared from the best mothers under favorable conditions, by careful breeders under the best-known methods. **Guaranteed to be as good as the best, to be free of disease and to give satisfaction.**

Untested, $2.00; 12 or more, $1.50 each. Tested, $3.00 each.
Breeders, $10.00, $15.00, and $25.00 each, shipped in nucleus.

If you want bees and equipment, consider our full COLONIES Italian bees in new painted hives, good combs, young tested queens.

Full Colonies as above, in eight-frame hive	$20.00
Full Colonies above, in ten-frame hive	$22.00

Beginners' outfits a speciality.

Nuclei

All our nuclei are furnished on good combs well filled with brood and a good supply of young bees.

One-frame nucleus, no queen	$3.50
Two-frame nucleus, no queen	6.00
Three-frame nucleus, no queen	8.25

Nuclei for Early Shipment

We have 500 two-frame nuclei that we can ship starting April 10th. These will be supplied with young tested queens already introduced to the nucleus and will be first-class in every respect. Order early before they are all gone. With tested queen, $9.00 each.

One carload of full colonies in eight-frame hives for shipment from Helena, Ga. All have young Italian queens, $12.50 each.

Our Special Package

We have tried out this package for several years, and it has given good satisfaction. They build up much quicker than a two-pound package. They go thru to destination with little loss of bees, then you have no trouble to get them all established.

One comb of brood with one pound of bees....$6.00, no queen.

Package Bees

We guarantee safe arrival of all package bees within six days of shipping point.

One-pound package bees, no queen	$3.50 each
Two-pound package bees, no queen	6.00 each

Safe arrival and satisfaction guaranteed on everything we sell. Shipment to be made from either Mayhew, Miss., or Helena, Ga.

The Stover Apiaries

Mayhew, Miss.

Now you're heard that first robin, you realize that Spring is here, and that it is time to get in those supplies before the "rush" begins.

What about those veils, smokers, tools, hives, supers, sections, foundation, and extractors? Send us your order, large or small. We will give it our best attention.

DON'T BE
APRIL
FOOLED

ORDER
NOW

F. A. SALISBURY
1631 West Genesee St.
Syracuse, N. Y.

*New York State Beekeepers
Send for our Catalog.*

Bees have wintered well, and we expect a fine crop of honey. Don't lose out by not having your supplies ready. Order now. We can make prompt shipment at present time.

If you haven't our catalog, write us today. We have everything in stock. Write us for quotations. We are here to give you SERVICE.

THE AULT 1921 BEE SHIPPING CAGE

Patent Pending

1st. It is a dark cage, much more so than the open screen cages we have been shipping in in the past.

2nd. The feeder uses pure sugar syrup. Better than Honey or Candy to ship on; it contains water as well as feed.

3rd. Feeders are made more substantial, 1-3 larger, and have screw cap that will not jar out.

4th. Instead of one small hole, we now use a cotton duck washer in the screw cap that has proven to overcome all the objections found to the liquid feed method.

5th. The Cage is one piece screen wire protected by thin boards on the outside. Send for free circular describing the cage in detail, prices, etc.

Queens—Package Bees—Queens

Will book your order with 20 per cent down, balance just before shipping. My Free Circular gives prices in detail, etc. Safe delivery Guaranteed within 6 days of shipping point. We ship thousands of pounds all over U. S. A. and Canada.

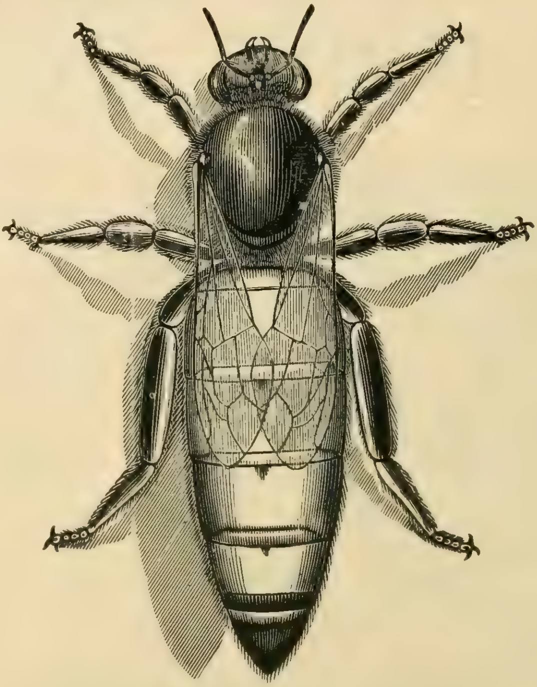
1-pound package bees, $3.00 each, 25 or more $2.85 each.
2-pound package bees, $5.00 each, 25 or more $4.75 each.
3-pound package bees, $7.00 each, 25 or more $6.65 each.
F. O. B. Shipping Point. Add price of queen wanted.

1 Untested Queen, $2.00 each; 25 or more, $1.75 each
1 Select Unt. Queen, $2.25 each; 25 or more, $2.00 each
1 Tested Queen, $3.00 each; 25 or more, $2.70 each
1 Select Tested, $3.50 each; 25 or more, $3.00 each

Nueces County Apiaries

E. B. AULT, Prop. --::-- Calallen, Texas

"Queens that are reared to please."



Highest Quality---Prompt Service---Satisfaction

Our Reliable Three-Banded Italian Queens

will be ready by return mail promptly after April 5th. We will have 1500 Nuclei in full operation and can take care of orders by return mail. All orders filled promptly by return mail or money refunded. Requeen your colonies early.

Why Order Farmer Queens?

They are bred by as skillful and experienced queen-breeders as can be found in the United States. There are very few places where queens are reared under as favorable conditions as in our queen-rearing yards. We devote our time to rearing as good queens as possibly can be, and we positively guarantee that no better can be reared; we spare neither labor nor money in developing our strain of Italians. It is our intention to improve our original stock each year and to be more skillful queen-breeders. Our first original stock was procured from the highest quality obtainable, which we have proved to the highest point and is now not surpassed by any. Our own eyes inspect every queen that leaves our yards; no culls sents out. Place your orders, and after you have given our queens a fair test and you are not satisfied in every way that they are as good as any you have ever used, just return them and we will send you queens to take their places or return your money. They are very resistant to diseases, the very best for honey-gathering. You take no risk in buying our queens; safe arrival in U.S.A. and Canada; satisfaction is left entirely to purchaser; prompt service given to all orders; every queen guaranteed to be purely mated.

OUR PRICES

	1	6	12	100
Untested	$1.50	$8.00	$15.00	$100.00
Select Untested	1.75	9.50	17.00	120.00
Tested	3.00	14.75	25.00	
Select Tested.	4.00	23.00	42.00	

Write for prices on larger quantities than 100.

The Farmer Apiaries, Ramer Alabama

Where the Good Queens Come From.

ACCOMPLISHED

1500 Colonies of Bees Wintered Without a Single Loss!

The colonies are in excellent condition, many of them stronger than they were last fall. The bees are the most vigorous we have ever seen. Our stock is already noted for its hardiness, resistance to bee-disease, and honey gathering qualities.

We are prepared to furnish bees from this stock in full colonies or nuclei. Bees in pound packages for June delivery. Consult our catalog for prices and other information.

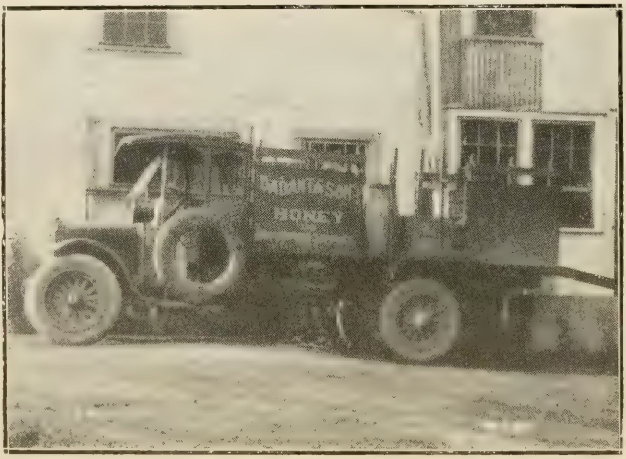
We were successful in obtaining breeding queens direct from Italy last season. We will be in position to furnish daughters from this imported stock during the coming season. Write for particulars.

THE A. I. ROOT COMPANY
MEDINA, OHIO

Over 50 years in the bee industry

The Dadant Foundation Factory

requires many thousand pounds of beeswax to keep running full force. The accompanying photograph shows a truckload of beeswax being unloaded at the foundation factory.



There were shipments from 62 different parties, coming in by freight, express, parcel post, and by boat.

So carefully checked, weighed, and cared for are these that it is a rarity to have a lost shipment, a complaint of weights, or dissatisfaction in any way. Some wish cash, some bee supplies, but most want DADANT'S FOUNDATION.

The same care is used throughout the process of Dadant Foundation manufacture, packing, and shipping.

As much pains is taken to be correct and give satisfaction with a one-pound lot as with a two-ton shipment. Satisfaction guaranteed.

DADANT'S FOUNDATION is NOT the quick invention of a week's or a month's time.

BUT it is the evolution of years of time combined with the test of new methods variously tried and painstakingly improved; and the finished product put to a thorough test on a large scale.

DADANT'S FOUNDATION---Every inch, every pound, every ton equal to any sample we have ever sent out. Specify it to your dealer. If he hasn't it, write us.

Dadant & Sons

Hamilton, Illinois

Catalog and Prices on Bee Supplies, Beeswax, Wax Working into Comb Foundation and Comb Rendering for the asking.

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The Annual Spree

VOL. XLIX **May, 1921** NUMBER 5

You all know the value of good Queens. When buying why not buy the **BEST**. Our Queen-rearing Apiary, in charge of Henry Perkins, will be able to supply the "Best" Queens obtainable shortly after April 1st.

Send in your order at once to avoid delay in securing your requirements. Prices very attractive. Satisfaction guaranteed.

MILLER BOX MANUFACTURING CO.
201 North Avenue 18
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QUALITY TIN CANS FIRST

For PACKERS and MANUFACTURERS of FOOD PRODUCTS

LARGE CAPACITY
LONG EXPERIENCE

YOUR INQUIRIES SOLICITED

W. W. BOYER & CO. INC.
BALTIMORE, MD.

Southern Headquarters for Package Bees and Reliable Queens

Three-Banded Italians Only

PRICE OF BEES: 1-lb. package, $3.50; 2 lbs., $5.50; 3 lbs., $7.50, Add price of grade of queen wanted to these prices. Write for descriptive price list

PRICE OF QUEENS: Untested, $1.50 each; six, $8.50; twelve, $16.00; fifty or more, $1.25 each. Select untested, $1.75 each; six, $9.50; twelve, $18.50; fifty or more, $1.50 each. Tested Queens, $3.00 each.

Prompt service, safe arrival of queens, and satisfaction we guarantee. Any of our untested queens that prove to be mismated will be replaced free of charge. No foul brood or other contagious bee disease has ever been in our vicinity.

W. D. ACHORD - - - FITZPATRICK, ALABAMA

Indianapolis Can Give You Some Real Beekeeping Service

We ship your order the same day it is received. Let us give you some of this service. Catalog for the asking. Write for prices on beeswax

THE A. I. ROOT COMPANY
873 Massachusetts Avenue, Indianapolis, Ind.

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THE A. I. ROOT COMPANY, Publishers, Medina, Ohio

Editorial Staff

Geo. S. Demuth and E. R. Root	A. I. Root	Iona Fowls	H. G. Rowe
Editors	Editor Home Dept.	Assistant Editor	M'n'g Editor

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—$1.50—

Order direct from us or any of the G. B. Lewis Co. distributors.

You're right—this is "Tommy" Atkins of the Lewis Co. Atkins is on the job at almost every convention. Next time you see him, warm up to him; he's a jolly good beeman. Do you see, he won't get stung? He has a Muth Ideal Veil.

WE HAVE A COMPLETE STOCK of Lewis Beeware. Have you taken advantage of our attractive prices on Bee Supplies? Send us a list of your requirements for quotation. Send for catalog.

WE ARE AGAIN IN THE MARKET for shipments of Honey. What have you? Send sample with your best price delivered to Cincinnati.

OLD COMBS AND WAX.—DON'T muss around rendering old comb; it often spreads bee disease. Send for shipping tabs and bag it up at once. We pay you the market price for wax rendered, less 5c per pound for rendering charges.

BEES. TWO-FRAME NUCLEI WITH Queen, $8.50. Our Nuclei will make a strong colony by fall.

QUEENS. JASPER KNIGHT'S FAMous Three-Banded Select Untested Queens, $2.00. For quantity orders write for special prices.

The
FRED W. MUTH CO.
Pearl and Walnut,
Cincinnati, O.

"SUPERIOR" FOUNDATION

Yes, we are ready for the rush. Many tons now ready for shipment, and our machines are running to utmost capacity. Use the best. If your dealer can't supply you, write us for price, stating quantity required. We also accept beeswax for foundation or supplies.

"Everything in Bee Supplies"

SUPERIOR HONEY COMPANY
OGDEN, UTAH.
(Manufacturers of Weed Process Foundation)

Airco! Airco! Airco!

Use it once, and you will proclaim it to all your friends and enemies as THE premier foundation on the market today. There are others—but then they aren't Airco. They are different. You will think it the best you have so far used.

THE A. I. ROOT COMPANY OF CALIFORNIA
Los Angeles: *1824 E. 15th Street* San Francisco: *5254 Main Street*

A Superior Quality
At Less Cost

SUPPLIES

A Superior Quality
At Less Cost

Prices of Honey as well as most commodities have come down. There is no reason why prices of Hives and Supplies should be as high as the prices which are being charged by most supply manufacturers.

Our prices, as will be noticed by comparing prices on items listed below, are so reasonably low, that competitors claim superiority on the mere strength of their higher prices.

When you order Diamond Match Company's supplies you get the best that is obtainable at any price.

On orders amounting to $50.00 or over deduct 5 per cent.

Hives, Supers, etc., listed below are in the flat, and are complete with Hoffman frames, nails, metal rabbets, and all inside fixtures.

One-story Dovetailed Hive

Five 8-frame	$16.00
Five 10-frame	16.90

Full-Depth Supers

Five 8-frame	$8.00
Five 10-frame	9.00

Shallow Extracting Supers

Five 8-frame	$6.00
Five 10-frame	6.50

No. 1 Style Comb Honey Supers

Five 8-frame	$5.75
Five 10-frame	6.25

Standard Hoffman Frames

100	$8.50
500	40.00

Shallow Extracting Frames

100	$6.70
500	32.50

Our Incomparable Quality Foundation

Medium Brood

5 lbs.	82c per lb.
25 lbs.	81c per lb.
50 lbs.	80c per lb.

Thin Super

5 lbs.	90c per lb.
25 lbs.	89c per lb.
50 lbs.	88c per lb.

Especially prepared Beehive White paint, one-half gallon cans..$2.10

Hoffman & Hauck, Inc.

Woodhaven, New York

HONEY MARKETS

U. S. Government Market Reports.

SHIPPING POINT INFORMATION, APRIL 15.

LOS ANGELES.—Supplies still generally heavy but old crop cleaning up in some sections. Poor wire inquiry, movement slow, market weak. Carloads f. o. b. usual terms, per lb., few sales, white orange blossom, 12½-13c, white sage 12-12½c, light amber alfalfa 6-6½c, light amber sage, 7½-8½, white alfalfa 7½-8c; Hawaiian white 7c, light amber 6c, honeydew honey 4½. Producers are reported as offering contracts for new crop white orange blossom 10c per lb., but buyers are holding off. Prospects for the honey crop are generally favorable thruout the State except in San Diego district and Salinas Valley where rainfall has been very light. Darker grades of honey are now on cheap price basis and competing with sugar for commercial use. The outlook is for a continued downward trend in prices for the darker-colored stock.

INTER-MOUNTAIN REGION (COLORADO AND IDAHO).—Shipments are lighter than for the preceding two weeks, the movement of comb honey being reported as especially light. What few sales are made are nearly all in less than carlots. White sweet clover and alfalfa mixed is being offered in carlots at 8c per lb.; but the lower prices at which stock can be purchased in California is proving too heavy a competition for most buyers, and they are accordingly holding off.

FLORIDA.—Due to favorable weather conditions, the nectar flow commenced unusually early, and considerable honey has already been produced. It is expected that the crop this year will be larger than that a year ago.

TELEGRAPHIC REPORTS FROM IMPORTANT MARKETS.

BOSTON.—No carlot arrivals since last report. Almost no demand or movement, dealers are holding at prices prevailing two weeks ago. Comb: Sales to retailers very few. New Yorks, 24-section cases white clover No. 1, heavy $8.50-9.00, light $7.00-7.50; Vermont, 20-section cases white clover No. 1, heavy $8.00-8.50, light $7.00-7.50. Extracted: Sales to confectioners and bottlers, Porto Ricans, few sales of amber 85c per gal. California, too few sales to establish market. Brokers' quotations delivered Boston follow: California, per lb., white sage 15-16c, light amber 10-14c, amber 7-9c. Beeswax, no sales reported.

CHICAGO.—No carlot arrivals but approximately 10,000 lbs. arrived from various States including Ohio, Colorado, California, Montana. Market very dull. Movement of extracted almost at standstill, attributable apparently largely to cheap sugar. Several dealers have from ½ to 1½ cars in warehouses; one large bottler is buying practically nothing. Extracted: Sales to bottlers and blenders, Colorado, Montana, and California, alfalfa and clover, white 12-12½c, light amber 9¾-10c. Comb: Ohio, Minnesota, Illinois, 24-section cases alfalfa and clover No. 1, heavy $6.50-7.00, light weight, discolored, $5.00-5.50. Beeswax: Receipts and supplies moderate, market dull, movement slow and irregular. Still considerable foreign wax being offered, this depressing market somewhat. Sales to wholesale druggists, insulator manufacturers, harnessmakers, etc.: Texas, Oklahoma, and Missouri, light 30-33c, dark 26-29c; South American and African, unrefined 18-24c, mostly around 22c.

CINCINNATI.—Since last report, 1 car California, 1 car Wyoming arrived. On account of the refusal of the principal honey and beeswax receivers to furnish the information necessary to report market conditions and prices in Cincinnati accurately and completely, no report can be published for this important honey and beeswax center.

CLEVELAND.—No carlot arrivals since last report. Supplies are liberal but movement very draggy. Extracted: Dealers quote western, 60-lb. cans in 5-case lots or more; white sweet clover 16½-18c, amber alfalfa 16-16½c.

DENVER.—Market continues quiet, demand and movement very light. Sales to jobbers, extracted: Per lb., Colorado, white 13-13½c, light amber 12½-12¾c, amber 12c. Comb: Colorado, 24-section cases, No. 1, white $6.08 per case, No. 2, $5.63. Beeswax: Prices paid farmers average, yellow 20c per lb.

KANSAS CITY.—No carlot arrivals since last report. Supplies liberal, demand and movement slow on extracted, fair on comb. Sales to jobbers, extracted: Missouri, Kansas, and Nebraska, light amber various flavors 12-13c; California, Utah, and Oregon, extra light amber and white alfalfa, mostly 12c, Utah and Oregon, dark amber 10c. Comb: Colorado, 24-section cases No. 1, mostly $6.00. Beeswax: Sales to jobbers, in small way, mostly 25c per lb.

NEW YORK.—Light l. c. l receipts from New York and California arrived, moderate receipts from South America and West Indies. Supplies liberal, practically no demand or movement, market weak, very few sales. Very few dealers doing any buying at all. Reduction in sugar prices has appreciably affected market for honey. Spot sales to jobbers, wholesalers, confectioners, bakers, and bottlers, extracted: Domestic, per lb., California, light amber and white alfalfa, mostly 7-8c, few 9c; white orange blossom and white sage, mostly 10-11c, few 12-13c. Imported, West Indian and South American, refined, mostly 5-5½c per lb.; 60-65c, few high as 70c per gal. Comb: No supplies, no sales. Beeswax: Domestic receipts light, foreign receipts moderate. Supplies liberal, demand and movement very slow, market weak. Few sales, only drug trade and few manufacturers of wax articles doing any buying. Spot sales to wholesalers, manufacturers, bleachers, and drug trade: South American and West Indian, light best 24-25c, few high as 28c, slightly darker low as 19c; African and West Indian, dark 15-16c, few 17c per lb.

PHILADELPHIA.—No carlot arrivals reported. Supplies light but more than sufficient to meet demand. Market steady Few sales to bakers, extracted: Porto Rican, light amber 65-68c, amber 60-63c per gal. Comb: No sales. Beeswax: Supplies liberal, demand slow, market dull, manufacturers showing very little interest, dental manufacturers buying lightly. Sales to manufacturers per lb., imported, African, dark 15c; Chilean, light 30c; domestic, light 30-35c.

ST. LOUIS.—Comb, no receipts reported. Supplies moderate, market very dull, very few sales. Demand very limited and movement confined to small lots in sales direct to retailers. Colorado, 24-section cases, white clover and alfalfa, No. 1 heavy around $8.00, light $7.00. Extracted: Light receipts, supplies liberal, practically no demand and very little selling, market very weak. Sales to wholesalers, per lb., Missouri, Arkansas, and Mississippi, light amber various mixed flavors, mostly around 12c, dark amber low as 10c. Beeswax: Receipts light, supplies moderate, very light demand, manufacturers not buying, very light movement from hands of jobbers. Sales to jobbers, Missouri, Arkansas, and Mississippi, ungraded average country run 23-24c per lb.

GEORGE LIVINGSTON,
Chief of Bureau of Markets.

Special Foreign Quotations.

LIVERPOOL.—Since our last report no business has been done whatever, and values remain nominal, owing to there being no demand and heavy stocks. The value of extracted honey is about 11 cents per pound. The beeswax market is also quiet. The value per pound for Chilean at today's rate of exchange is 26-27c. Taylor & Co.

Liverpool, England, April 5.

CUBA.—Honey is quoted at 40c a gallon; yellow wax, 20c a pound. A. Marzol.

Matanzas, Cuba, April 6.

Opinions of Producers.

Early in April we sent to actual honey producers, scattered over the country, the following questions:

1. What per cent of the 1920 honey crop is now in the hands of producers? Comb? Extracted?
2. What has been the total of winter and spring loss of colonies in your locality? Give answer in per cent.
3. What is the condition of the colonies at present compared wtih normal, considering strength, amount of brood, and amount of stores? Give answer in per cent.
4. What is the condition of the honey plants at this time compared with normal? Give answer in per cent.

For the southern States and California the following additional question was asked:

5. How does the early honey flow thus far compare with normal? Give answer in per cent.

State.	Reported by	Ex. on hand	Loss	Col. Con.	Plant Con.	Hon. Flow
Ala.	J. M. Cutts....	75	2	135	125	100
Cal.	M. H. Mendleson	10	4	100	65	15
Cal.	L. L. Andrews..	1	10	75	60	30
Col.	[illegible] A. Green	30	15	70	100	
Fla.	Ward Lamkin ..	10	0	100	100	50
Ill.	A. L. Kildow....	?	3	125	50	
Ind.	E. S. Miller.....	30	5	100	100	
Iowa	Frank Coverdale.	5	2	120	70	
Kan.	J. A. Nininger...	0	7	80	75	
La.	E. C. Davis.....	10	15	100	100	100
Md.	S. J. Crocker....	15	10	125	100	
Mass.	O. M. Smith....	10	1	100	100	
Mich.	B. F. Kindig.....	7	2	125	100	
Miss.	R. B. Willson....	50	2	125	125	150
Mo.	J. W. Romberger.	0	7	95	100	
Neb.	F. J. Harris....	0	5	75	95	
N. J.	E. G. Carr......	5	5	75	80	
N. Y.	Geo. H. Rea.....	5	5	100	100	
N. Y.	Adams & Myers..	25	0	95	98	
N. Y.	F. W. Lesser....	2	2	125	100	
Ohio	Fred Lininger....	0	0	100	100	
Okla.	Chas. F. Stiles...	5	0	90	60	
Ont.	F. Eric Millen...	5	1	110	75	
Pa.	Harry Beaver....	0	5	110	100	
Tex.	T. A. Bowden...	5	8	80	100	90
Tex.	J. N. Mayes.....	0	2	125	125	
Tex.	H. B. Parks.....	5	3	100	100	88
Utah	M. A. Gill.......	10	6	100	120	
Va.	J. H. Meek.....	5	5	95	90	
Wash.	G. W. B. Saxton.	25	10	105	100	
Wis.	H. F. Wilson....	10	18	120	100	

The amount of comb honey on hand in Massachusetts and New York is 10 per cent; five per cent or less in California, Colorado, Indiana, Iowa, and New York; and none in the other States.

BOOKS AND BULLETINS

The League Bulletin, No. 1, Vol. 2, dated March, 1921, has just been issued by the American Honey Producers' League. This bulletin reviews the objects of the league, gives a list of its officers, its history, its constitution, a report of the meeting held at Indianapolis on Feb. 15-17, and the treasurer's report. H. B. Parks, P. O. box 838, San Antonio, Texas, is secretary.

Bees and Beekeeping, by Frank R. Cheshire, F.L.S., F.R.M.S., in two volumes has been reprinted with an appendix, bringing the work up to date by J. B. Lamb.

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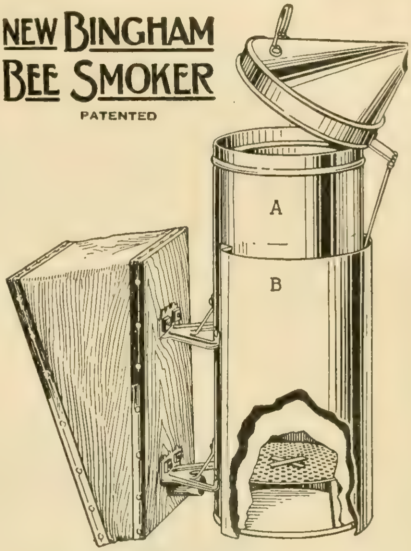

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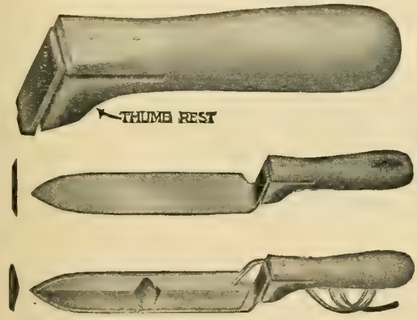
Little Wonder	3 x5½	1½



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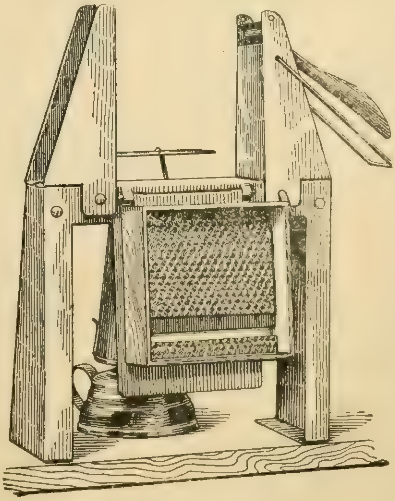

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GLEANINGS IN BEE CULTURE

MAY, 1921

EDITORIAL

Beware a Shortage of Stores.

THE COLONIES are so strong and have so much more brood than usual for this time of year thru the northeastern portion of the country that there is great danger of their running short of stores before the beginning of the main honey flow. In the clover region the next few weeks is a critical time in this respect; and beekeepers should keep a close watch on the stores, for even a few days of bad weather may bring these big colonies to the verge of starvation and practically ruin them for the season.

On the other hand, these mammoth colonies are able to send such a large force of bees into the fields whenever the weather is favorable that they are often able to replenish their stores and actually gain in weight at this season while weaker colonies are starving.

No beekeeper can afford to take chances on meager stores at this time unless nectar is being gathered freely every day. Every colony should have 10 to 20 pounds of honey in advance of their needs to draw on during bad weather. No other one thing, in the care of the bees, is so important at this season as an abundance of stores.

* * *

The Honey Situation Improving.

AS WILL be seen by the Government market reports, the situation is improving. Honey is starting to go to Europe in a limited way, and, what is of considerable significance, honey in bottles and tumblers is beginning to move. This is doubtless due to a slight improvement in the economic situation over the country generally. In the mean time the crop in southern California is not going to be as large as was first predicted. See report by L. L. Andrews in this issue, in the California department. The crop of Texas mesquite has been cut short by rains that came too soon.

The heavy freezes and blizzards, preceded by a prolonged spell of warm weather, have killed the early fruit bloom thruout a large area, and reports from all over the country indicate that this will be one of the shortest years for fruit that has been known in years. The possible loss of bees by starvation thruout the United States on account of heavy breeding, the reduction in the California crop, and the failure of the fruit crop thruout a large portion of the country will have an influence in stimulating an upward trend in honey prices.

* * *

Isle of Wight Disease.

A REPORT of the investigations on the Isle of Wight disease by Dr. John Rennie and his associates, which led to the discovery of the cause of this baffling malady, has just been published in Transactions of the Royal Society of Edinburgh, Vol. LII, Part IV. (Issued separately as No. 29, March 25, 1921.)

This paper is in four parts: (1) The Etiology (cause) of the Disease, by John Rennie, D.Sc.; Philip Bruce White, B.Sc., and Elsie J. Harvey; (2) The Pathology of the Isle of Wight Disease in Hive Bees, by Philip Bruce White, B. Sc.; (3) Isle of Wight Disease in Hive Bees—Experiments on infection with **Tarsonemus Woodi**, by Elsie J. Harvey; (4) Isle of Wight Disease in Hive Bees—Acharine Disease: The organism associated with the disease—**Tarsonemus Woodi**, by John Rennie, D.Sc.

The authors give a brief review of the previous observations on this disease since it was first recognized in the island from which it derives its name in 1904, mentioning the work of Imms (1907), Malden (1909), Graham Smith, Fantham, and others (1912-1913), Anderson (1916), Anderson and Rennie (1916), and Rennie and Harvey (1919, two papers).

In 1912 and 1913 Graham Smith and others put forward **Nosema Apis** as the cause of the Isle of Wight disease, but in 1919 Anderson and Rennie, and Rennie and Harvey succeeded in establishing that **Nosema** infection is not found in Isle of Wight disease, but is the cause of a distinct malady. Similar conclusions had been drawn by Dr. White in this country in 1918.

The cause of Isle of Wight disease is now found to be a hitherto undescribed mite, identified by Dr. Rennie as belonging to the genus **Tarsonemus**, which it is proposed to name **Tarsonemus Woodi** in honor of A. H. E. Wood, who rendered financial aid in carrying on the investigations.

He Made Millions —for Others.

AN ITEM is going the rounds of the press to the effect that Dr. C. C. Miller, at the age of 85, after having tried 14 different kinds of work, went into beekeeping; that his wife, in 1861, caught a swarm of bees and hived them in a sugar barrel. The story goes on to recite that he became so much interested that he made beekeeping his life work, and then adds, "Now he sells 20,000 pounds of section honey yearly, and is worth nearly two millions of dollars;" that "he has been stung 4,000 times; has become immune to stings, and has invented a successful treatment which brings him a considerable income."

Like many other newspaper stories this one is founded on a scintilla of truth. Dr. Miller did make a humble start, and did become interested in bees until he became one of the greatest authorities in the world. He did sell 20,000 sections of comb honey in one year when he was 85; but that was the only year when he produced so large an amount from so small a number of colonies. He did not "invent a successful treatment" for stings.

Dr. Miller, like most beekeepers, had his ups and downs. He made a comfortable living; he enjoyed the outdoors; but that he was worth "nearly two millions of dollars" is a joke. We wish it were so. His great asset in life was his ability to teach. While he did not make "millions" for himself, he enriched his fraternity by many millions. He showed how to keep bees better. His ideas were sound. His book, "Fifty Years Among the Bees," is as fascinating as a novel. His modest "Stray Straws" sparkled with gems. They were nuggets of gold. His constant look heavenward inspired thousands of lives, making better people as well as better beekeepers. He always said, when there chanced to be a poor honey year, "I have enough to eat. I am comfortable. I can get along if I do not get a drop of honey." This was because he was looking ahead.

Now, then, since he did not make millions for himself, but did make millions for his brother beekeepers all over the world (for his influence went beyond the United States), shall we not show our appreciation by contributing to the Dr. C. C. Miller Memorial Fund, mentioned on pages 8, 137, and 233, on his birthday, June 10 next? Amounts all the way from ten cents up will be received and credited to the fund. The good doctor, if he were alive, would appreciate more, we feel sure, a fund built on a large number of small gifts than a fund created by large ones. It has been suggested that each beekeeper on June 10 next be prepared to send in his contribution to the Dr. Miller Memorial Fund. If you are afraid you will forget it, send it now after reading this.

We are sure that there are thousands upon thousands of beekeepers who have been helped by Dr. Miller. If he did not make millions for himself, yet he has helped to make millions for others, and those others will doubtless wish to have some part in his memorial.

* * *

To Take Away the Queen Without Having to Find Her.

IN THESE days of short cuts and wholesale methods in beekeeping, the labor of finding the queens to make colonies queenless for swarm control or in requeening the apiary is sometimes a burdensome task. On page 275 of this issue F. G. Rauchfuss tells the readers of Gleanings how to take away the queen from each colony in the apiary without the labor of finding them.

This important article should be carefully studied by every reader of this journal, for it not only outlines a system of swarm control for comb-honey production, which probably involves less labor than any other system ever devised for this purpose, but it is also full of suggestions which the ingenious beekeeper will find useful in many other ways.

By the method outlined by Mr. Rauchfuss, the queens are taken away from the colonies just previous to swarming time. This can be done without seeing a single one of the queens that are taken away, and the labor involved is largely in connection with the giving of the first comb-honey supers. The whole operation of removing the queens by this method is so simple that the queens of an entire apiary can be removed within a few hours. This method of dequeening and requeening with young queens for the control of swarming has been used for many years by Herman Rauchfuss and his son, F. G. Rauchfuss, and it has enabled them to operate a series of widely scattered apiaries near Denver, Colo., in the production of comb honey by the carload.

The plan fits in well with the present-day tendency in comb-honey production of building up the colonies to rousing strength in two-story hives, and then at the beginning of the honey flow reducing to a single story to induce the colonies to send a large force of their younger bees into the supers. Instead of bringing about a tendency to swarm when this is done the colony is put into a condition comparable to the parent colony in nature, except that its full working force is retained, and such colonies seldom attempt to swarm during the same season.

The simple method of inserting a queen-excluder between the two stories of brood in which the queen is working, in order to confine her to one of them, then later looking for young brood instead of looking for the queen, and taking away the chamber which contains the young brood, can be used to dequeen colonies for ordinary requeening as well as for dequeening in swarm control. This saves much time and annoyance in hunting for the queens. When this method of swarm control is used in localities which do not furnish a later honey flow, as in most of the clover region, if increase is not desired, the hive containing the old queen may be left standing by the side of the colony on the old stand for a week or ten days after the division was made, then these brood-chambers can be piled up as supers over weaker colonies, not being used to produce comb honey, paying no attention to the old queens. At the close of the season these brood-chambers, which should now be filled with honey, may be put back one on each hive after the comb-honey supers are removed. In this way the colonies are requeened, swarming is prevented, and every colony put in a fine condition for winter by a few simple operations, without the necessity of finding a single queen, for the bees will take care of the job of disposing of the old queens.

Swarm Control in Extracted Honey Production.

WHEN ARTIFICIAL swarms are made to anticipate the issuing of natural swarms in producing extracted honey, it is not necessary to set the parent hive at one side, as in comb-honey production; but the parent colony and the swarm may both be left in the same hive, the swarm being in the new brood-chamber at the bottom of the hive and the brood-chamber of parent hive (having all queen-cells destroyed) being placed above the supers. A queen-excluder used over the lower brood-chamber prevents the queen from going back to the combs of brood now above the supers. This plan is a variation of the Demaree plan in which the chamber containing the brood is placed directly above the queen-excluder, the supers being placed on top.

Placing the brood above the supers in this way separates the old brood-chamber from the new one more completely, which probably reduces the chances of a swarm issuing if a young queen should emerge in the old brood-chamber. In fact, some beekeepers who use this method do not find it necessary again to destroy the queen-cells that may be built in the old brood-chamber after it is put above the supers, provided there are at least two full-depth extracting supers between the new brood-chamber at the bottom of the hive and the old brood-chamber now at the top of the hive. In addition to this, placing the supers directly above the new brood-chamber usually results in the bees working in them better than when they are more remote.

When artificial swarms are made in this way the new brood-chamber may be filled either with empty combs or frames containing full sheets of foundation, together with one empty comb. This plan for swarm-control is used by many successful producers of extracted honey, being especially adapted to conditions usually prevalent in the clover region.

A condition similar to this can be brought about with but little labor in all colonies, whether they are preparing to swarm or not, by the following plan: If the bees are wintered in single stories, add a second story of empty combs, preferably dark combs in which brood has been reared previously, adding this second story early, before the colonies become crowded, permitting the queen to have a free range thru both stories. At the beginning of the honey flow add another extracting super as soon as needed. Under these conditions the queen usually abandons the lower brood-chamber, working chiefly in the second story.

About a week after the beginning of the honey flow or after the queen has abandoned the lower brood-chamber long enough so that the brood in this chamber has all been sealed, put the queen into the lower brood-chamber, confining her there by means of a queen-excluder; add another super of empty extracting combs, if needed; and, finally, put the brood-chamber, which was formerly the second story and which now contains most of the brood, on top of the supers.

The bees are now compelled to establish their brood-nest anew in the lower brood-chamber, which at this time usually contains some sealed brood and much pollen. They are usually rather slow in preparing cells for the queen, and the new brood-nest is not expanded rapidly.

While one might think at first that confining the queen to a single story after she has had a free range of the hive would increase the tendency to swarm, it will be seen that colonies treated in this way are in a condition similar to colonies that are hived on a set of empty or nearly empty combs. Apparently the re-establishment of the brood-nest in these combs, which have been abandoned for brood-rearing, is just as effective as tho these combs had been brought from the shop or honey-house instead of being a part of the hive at the time of the manipulation. If the honey flow is short, colonies treated in this way usually go thru the season without attempting to swarm, but they may do so if the honey flow is of long duration.

David Running, Filion, Mich., gives a second story early, then later puts the queen below an excluder, as outlined above. About ten days later he shakes the bees of the lower brood-chamber, together with the queen, into a new brood-chamber filled with frames of foundation and one empty comb or a full set of empty combs, and puts the brood from which the bees have just been shaken on top of the supers, thus combining the two methods given above, to insure that no swarms shall issue during a prolonged honey flow.

FOREHANDED BEEKEEPING

A New Era in Beekeeping. Elimination of Fussy Spring Management. Forestalling Avoidable Loss

By Morley Pettit

During my lifetime a revolution has taken place in beekeeping practice. I was taught to give bees the attention they called for from time to time, watching for swarms in summer, for cellar temperatures in winter, and for robbing in spring. We enlarged and contracted entrances, hived swarms that came off, extracted a few combs at a time as they became ready, and were lackeys in constant waiting on the number of hives that one location could support. We could not start an out-apiary, because it took all our time to manage the one we had at home. The one yard yielded a fair profit, but there was no future except to be a pottering ''beeman'' with a meager income. That was and is the kind of beekeeping which gives rise to the very prevalent idea that none but old people and incompetents should keep bees.

Right up to the turn of the century it was the all but universal custom to keep bees as indicated. The American bee journals were filled with methods of management. The bewildered reader was surfeited with instructions and advice. He was told how to prevent swarming **after the swarm had issued,** how to build up colonies—after poor wintering had weakened them, and so on. Something had to happen. The industry could not proceed, until someone untied the beekeeper from the thralldom of waiting on his one yard of bees. The crying need was for a system by which he could give one yard forehanded management in one day sufficient to last it for a week or more while he attended to other yards in the same manner. Here and there advanced thinkers were working on the problem in the eighties. They were making real progress in the nineties, and during the present century the development has been rapid.

It began with the prevention of swarming and has branched out into all phases of beekeeping. I have cast about in my mind to find a suitable name for this new idea in beekeeping practice. Until someone suggests a better, I shall call it ''forehanded beekeeping.'' Doubtless the distinction between it and the earlier methods is clear. It is to be the master of the situation, so far as the situation may be mastered. It is to prepare in advance for the more desirable conditions, so far as they may be controlled, leaving nothing to chance or what nature may provide. It is to foresee and forestall every avoidable loss. Forehanded beekeeping is founded on the best available knowledge of bee behavior and of every natural factor entering into the problem.

In what we have chosen to call ''forehanded beekeeping,'' methods of wintering and of spring management have shown great progress. We used to reduce brood-chambers to protect small clusters; now we endeavor to provide large clusters to fill the brood-chambers. We used to see how little we could feed in the fall and not starve the colony, weighing each hive and doling to each its pittance; now we feed practically all the colony will take and relieve ourselves of anxiety, knowing that ''millions of stores at our house'' will repay us in compound interest next spring. Above all we make sure of the **quality** of winter stores by feeding sugar syrup to every hive regardless of its weight.

Foundation for This Season's Crop Built Last Summer and Fall.

Just before the close of the honey flow we see that every colony has a good queen. When the light honey comes off about the first of August, each hive is left the equivalent of at least a half super of honey. This must be **in a super,** and not in the brood-chamber. The latter must be practically free of honey, and with no more pollen than the colony needs. Every brood-chamber is examined at that time to make sure it is in the favorable condition for brood-rearing just described. In our localities we are blessed with a superabundance of pollen and sometimes have to remove pollen-clogged combs. We recognize that each colony insists on having one pollen comb. We respect their wishes in this—we might as well—but we see that the other combs are fairly clear for brood.

Now with a brood-chamber clear for rearing the young bees which are to constitute the winter colony, and a queen able and willing to produce the eggs from which the young bees for the winter colony will grow, there must be a plentiful supply of food for these growing young bees in the supers, as previously stated. This point is so important that it will bear repetition. In fact, I can vouch for its importance because it has cost us more than the publisher would ever dream of paying me for this article to learn it. Besides providing for a dry fall, one must provide for a fall flow of honey by giving extra super space for storage. In other words, when hives are to be left to themselves while the apiarist is employed elsewhere, the necessary condition for success, which in this case is a full colony of young bees for winter, must be insured against all contingencies. It will be seen that we make no provision for the colony to supply itself with winter stores. On the contrary we do all we can to prevent it. We do not want the stuff they get in the fall, buckwheat honey included, in the brood-chambers for our winter of long confinement.

Quality of Winter Stores.

Every colony receives its generous supply of good sugar syrup, regardless of how much natural stores it may have. Whether honey or syrup is better for brood-rearing is a question for the physiologist to determine. There can be no doubt which is better for winter in the north. One only needs to attend conventions in regions where bees are subject to winter confinement to collect evidence enough to convict and condemn the folly of dependence on natural stores. Of course, the matter must be approached cautiously, for the evidence is not forthcoming in a discussion on wintering as such. Just last December at a largely attended convention in Ontario, various sources of fall honey were being discussed. Some expressed grave concern as to how their bees would winter on certain varieties of honey they had gathered. Others related heavy losses they had endured every time their bees wintered on certain kinds of honey. These were prominent beekeepers depending largely on their bees for a living. Their bees represent capital investment and source of income. They were discussing in a commonplace sort of manner experiences and prospects of losing hundreds if not thousands of dollars worth of property, of capital investment and source of income, without considering that there might be any alternative but to take such losses as a part of the season's experiences to be related at the next annual convention. Upon the whole they had such a delightful talkfest over the whole matter that those of us who knew a simple remedy could not find it in our hearts to interrupt. Anyway the discussion was on honey plants and not on wintering, so such an interruption would have been out of order.

Now do not let any more southern brethren smile in self-complacency over this little scene. Heavy winter losses attributed by the beekeepers themselves to faulty natural stores are often reported a long way south of the Canadian line in the United States of America. Do these unfortunate beekeepers learn their lesson? Not that I have noticed. ''It is not their custom to feed sugar for winter.'' That is the only answer I have been able to get and once again, ''It isn't done!'' precludes all further discussion. It is some years now since I learned in that best of schools with the highest tuition fees that a good feed of sugar syrup after most of the brood has emerged, will prevent all such losses. It is a simple principle in ''forehanded beekeeping,'' not at all original but often worth hundreds of dollars per annum.

Winter Packing Left on Late.

Our method of preparing colonies for winter was fully discussed in Gleanings last September. This method is calculated to carry them thru without any attention whatever until queen-clipping time in May. In brief, it consists in providing good queens and good colonies of young bees, an abundance of stores of the best quality, ample protection, and room enough for the early brood-rearing. On the principle that ''nothing succeeds like success,'' such colonies prepared this way have warmth and energy enough within themselves to move right along to the maximum strength which their queen is able to produce. The winter packing is left on till just before they require second supers, usually the latter part of May. First supers are given early in May within the boxes. The packing maintains a more uniform temperature by preventing rapid radiation of heat and actual escape of heated air when the outside temperature drops suddenly, as it frequently does during the northern spring. The heat produced by the large cluster of workers and by the developing brood raises the whole hive temperature, and the prolific queen spreads out great sheets of eggs which would simply perish on a cold night in an unpacked hive.

Early in May we find that the heat of brood and bees in most colonies is such that even on a day too cool for flying the workers are crowded to the outer corners of the hive, and even outside the entrance. As soon as this condition is found another story is added. If the brood-chamber is single, it is a second brood-chamber with dark number-one combs and no excluder. If a shallow ''food-chamber'' is present it may be an extra brood-chamber between the two or an extracting super with excluder on top, depending on the comb-space requirements of the queen. The extra space given so early serves a triple purpose, that of ample brooding space to rear harvesters, that of storage space for surplus honey, and that of clustering or resting space for the ever-increasing population desirous of escaping the brood-chamber heat. In all three it allows the colony to increase rapidly without becoming discontented and building cells for swarming. The vitally important job for the beekeeper now is to keep his growing families happy and contented each in its own home. As the supersedure of failing queens is one of the most fruitful causes of May swarms, we have with our young queens and roomy hives a combination which relieves us of practically all trouble in this line until clover opens in late June. This being a paper on spring and not summer management, we shall not pursue the swarm-control matter further now.

Clipping Queens.

We try to find and clip all queens on the first round in May. Clipping serves a double purpose, each of which is worth the trouble, and I can see no valid objections. Since ''accidents will happen'' it saves the loss of a whole colony of workers to have the queen clipped when a swarm occurs. With the queen clipped the swarm returns, barring the accident of a flying virgin, and we discover the condition on our next round. The second advantage is the queen record, and it is quite as important as the other. With unclipped queens we have no means of recording for certain the age or ability of the individual. The most serious objection I have heard to clipping queens is the possible loss of a queen failing to find her way back to the hive with the returning swarm. If anything this is an advantage, for any queen so ungrateful as to lead out a swarm after I have done what I can to make her and her people comfortable need expect no quarter from me. ''Off with her head!'' She is too much like swarming stock; we do not allow her cells to remain to reproduce her kind either if we can help it. In any case, is it not better to lose the queen and save the swarm than have both fly to the woods?

There is no royal road to finding queens. As the search is included in a general survey of brood-chamber conditions, we generally start at one side and look over each comb in order until she is found. As in other manipulations experience is a great help, altho I have seen beginners who learned to find them quite rapidly in their first season. The main thing is good eyesight and a quiet confident manner in handling the smoker and the combs. My sister, who naturally does such particular work better than I do, finds and clips hundreds of queens in May without a veil and with scarcely any smoke. The entrance must on no account be smoked, and the hive should be opened without a jar. With the least possible smoke and disturbance, the first comb is removed and the others examined in order, always leaving a space for the next one to be lifted when the last one is returned. The queen is very easily frightened and set to hiding. She may travel away from you as you proceed thru the hive. A glance on the next comb as it hangs in the hive when you lift one out may reveal her, or she may be on what was the dark side of the one just lifted. The queen is most apt to be found on combs having eggs or brood, or perhaps on the sunny side of the hive; but there is no need to despair until the last comb has been examined. I seldom look over the combs a second time. It keeps the hive open too long and the chance of finding her is much less than the first time. Next week she may be found quite easily. Some queens are always hard to find. When these do not show up after a reasonable search the whole brood-chamber population has to be sifted thru a queen-excluder.

To clip a queen I lift her from the comb by a wing grasped between thumb and finger of the right hand, at the same time holding the comb in my left hand with one end resting on the hive. The right hand may be steadied by projecting the little finger against the comb while catching the queen. As soon as the queen is safely lifted from the comb the latter is set down quickly to free the left hand for holding the queen for the clipping operation. Now press the tip of the index finger of the left hand gently against the under side of the queen's thorax, and she will grasp it with all six legs which have been sprawling in the air as she was held firmly by the wing. Close the thumb of the left hand on two of the longer legs, not too close to the body nor too tightly, and you now hold her by thumb and finger of the left hand with wings up ready to be clipped. I have a pair of short blunt pocket scissors, which are always in a convenient pocket winter and summer. They are useful for a great many purposes, including the clipping of queens. I take off two-thirds or more of both wings on one side, and try to leave the wings on the other side intact. This one-sided clipping cripples a queen for flying more than an even trim. As the wing is a dead membrane there is probably no pain caused by the amputation; but the man who recently advocated pulling a queen's wing out by the roots should be prosecuted by the humane society. I like this way of clipping because it is the way I was taught, and it comes easier to me than any other method. I could not bear the thought of mauling a queen's head and thorax between my clumsy thumb and finger, after viewing the beautiful and comlex organs of sense with which they are covered. The nervous strain of trying with curved scissors to clip a queen, as she walks about the comb, ''sends me clear up in the air.''

The clipping record is very brief but sufficient. We never clip a queen until she has gone thru one winter, so the record of each queen we clip this spring will be the same: ''C-21-1.'' When a queen is found to be already clipped we look for last year's record. If it is ''C-20-1,'' the new record is ''C-21-2.'' If for any reason last year's record is not available the record is ''C-21-0.'' Unless the queen is something very special either 2 or 0 is a death sentence, ''suspended,'' subject to good conduct, till near the end of the honey flow.

Inspecting for Disease.

This first time over the brood-chambers is an opportunity for a general review of conditions. A study of the brood reveals the ability of the queen to carry on, and, of course, we are alert for symptoms of disease. No European foul brood has reached us as yet, but occasional cases of American are found and have to be treated. When discovered early they are treated at once. When a few cells are detected in a good colony during the flow, the queen is removed and all cells destroyed a week later. As soon as the brood has emerged and when the flow is nearly over, the final treatment is applied. In all cases our treatment for American foul brood is the same. We call it the ''gasoline cure.'' The idea is not original but is the most effectual cure for this persistent disease we have ever tried. The method is as follows: In the evening when flying has almost ceased for the day, remove all supers, brushing and driving the bees down into the brood-chamber. Cover the hive and while scattered bees are getting in at the entrance take the supers inside the honey-house; or, if at an outyard, close them securely from robbers on the truck. When all are in, close the entrance tightly and raise the cover enough to pour a cupful of gasoline evenly all over the top-bars. Replace the cover as tightly as possible, listen for the roar of the bees to subside, and as soon as all is quiet, carry the hive to where a grave has been previously prepared, brush the bees into it, and bury them deeply. Render all super combs as well as those from the brood-chamber into wax, taking all necessary precautions to prevent the spread of infection. I am glad I do not have to decide for the beekeeper who has a large percentage of infected colonies; but where we have so few cases and there is so much at stake we would not consider any less drastic treatment.

Georgetown, Ont.

WORTH A LOT TO KNOW IT

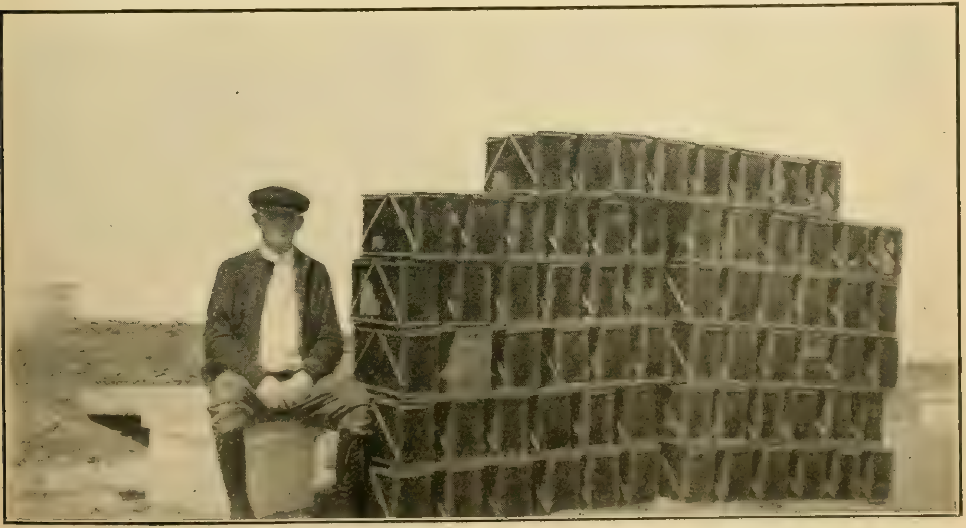
How to Ship Bees from South to North; Some Other Tricks Worth Knowing

By E. R. Root

WE have heard a good deal about beekeepers going from the North to the South for pastures new; but I am going to tell you about a beekeeper, who, altho his life has been spent in Texas, yet went north and made good. I refer to B. M. Caraway, formerly of Mathis, Texas, and now of Riverton, Wyoming.

It will be remembered that, while in the South, he was an extensive breeder of queens and bees. He also did a large business in shipping bees in package form to the northern States. He made a fine record, and one would think that he would stay where he was. But having a curiosity to know what the beekeepers of Wyoming were doing with so many bees they bought of him he made a trip there, and was so well pleased with the country that he bought out one of his customers and went into the business of honey production. But before doing so he began buying bees himself from the South in lots of 100 pounds to increase his holdings in bees. He has probably bought as many bees in packages as any single beekeeper in the northern States; and the very fact that he was formerly an extensive shipper of bees in that form himself will make his experience invaluable. As he has been on both sides of the deal he has learned some things that are worth giving to the public.

He, among other breeders in the South, discovered that he could send bees on sugar syrup made of one-half water and one-half



One shipment of bees made up into crates of six each, with one crate of two. Each cage has 3 pounds of bees, a can of syrup, half water and half sugar, and a queen caged among the bees. Experience shows this is better than to have her loose.

sugar without using candy. This is put into a tin can, self-sealing, with only a single hole in the bottom made with a small nail. The bees get this syrup thru this single opening as fast as they need it. The syrup has the advantage over candy because anybody can make it, and because it supplies both food and water. It is always uniform in that it does not become hard like candy so that the bees starve, nor does it become soft so that it runs and daubs the bees so much that they arrive at their destination a sticky mess. He finds that syrup solves the problem of a food for the transportation of bees in package form.

Caraway's truck and extracting-house at his home yard. It will be noticed that the weather is so warm that the hood of the engine is lifted off entirely. Think of its being *hot* in Wyoming where the winter record shows a temperature of 40 below zero!

While breeding and shipping bees Mr. Caraway learned also that the majority of honey producers in the northern States buy them in three-pound packages, with a queen caged among the bees—not released. This is the kind of package he had sent to him. The packages were shipped in lots of six to a crate. As will be seen by the illustrations, these containers were plain wire cages reinforced at the corners and tops, and braced at the sides. A single cage of bees will not travel as safely as a crate of six. Sometimes the crates are made large enough to hold as many as ten or a dozen three-pound cages.

So much for the "tricks of the trade" at the shipper's end of the journey. Let us now see what Mr. Caraway does at the other end of the route after the bees arrive, for we will not consider that he is a shipper but a receiver of combless bees. He explained that, after he went north, he lost a lot of bees even after they arrived in good order. He released several dozen three-pound packages of bees into hives outdoors, all at one time. The result was he would have a general mixup. The other bees of the yard would get in the game when there would be a general uproar. Mr. Caraway then struck upon this plan which I call **Caraway's thousand-dollar trick of the trade,** or at least it will be worth a thousand dollars the first or second season to a beekeeper receiving large consignments of combless bees. Mr. Caraway winters in cellars because of the very low temperature in Wyoming during the winter—the mercury sometimes going 40 degrees below zero, with very little snow. Along about the first of April the weather warms up, at which time he takes his bees out. When these are on their summer stands, and the cellar is empty, he makes up a set of hives ready to receive his packages of bees—as many hives as there are packages he expects to receive. He puts in each hive a frame or two of pollen, two combs containing a little honey, and one empty comb. This empty he puts in the center. If the other combs do not contain enough honey he pours syrup from a height into them. The hives thus prepared are all placed in the cellar; and when the shipment of bees arrives, if it is at night he puts them in the cellar. Next morning he lifts out his can of syrup from one of the cages, draws out the cage containing the queen, by means of a wire, from the bees and hangs this on the center comb that is empty. He then jars out of the cage perhaps 25 per cent of the bees so that they will surround the queen and keep her warm. He next lays the cage in the empty space in the side of hive not occupied by the combs; for by the plan outlined there will be only five combs for the three pounds of bees. In 24 to 36 hours the bees will have deserted the cage and gone to the queen. He now lifts out the cage, slides the frames over, and fills out the remaining space on each side with frames of foundation. In a like manner he releases the bees in all of the other hives, after which they are kept in the cellar in perfect darkness for four or five days. This is important, and is the secret of the trick. In the mean time the bees get started in real earnest without molestation, start breeding, and begin to draw out the foundation—in short, settle down to regular housekeeping. At the end of the

Stuck in the mud; a sample of Mr. Caraway's Wyoming roads; good bee country, but travel very difficult, especially to an outyard location. Men are required to take shovels, picks, and general equipment to help them out of the mire if needed.

period these newly formed colonies are set outdoors the night before, when they will be ready to defend their entrances and maintain their identity. In this way he saves all the bees that arrive in good order. He avoids the uproar of robbing and saves the queen.

There! do you get that thousand-dollar trick? And don't you see it will not take many shipments like this to save the thousand dollars?

Doubtless there are receivers of bees in package form who do not winter in cellars. I believe it would pay such to use the house cellar after making it dark, and carry out Mr. Caraway's plan, for it will work as well on one package as on a hundred.

Mr. Caraway says that his experience has shown repeatedly that a package of three pounds of bees and a queen, if it arrives in good order, is in every respect equal to an average colony wintered in the cellar. In some cases the package bees are cheaper, if cost of stores, care of moving into and out of the cellar, etc., are taken into consideration.

It is not always "smooth sailing" in Wyoming, as will be seen by the class of roads that are encountered. (Excuse the mixup in the figure of speech.) The machines get mired in the soil, for there are no roads there. He and his men have had numerous occasions to dig their machine out of the mud, as one of the illustrations will testify.

Another difficulty is the extreme cold, the mercury at times going down to 40 degrees below zero; and, strangely enough, it is excessively hot there during the summer.

In regard to cellars Mr. Caraway believes, with the writer, that they should be relatively long in proportion to their width in order to get a large amount of exposure to Mother Earth. His cellars are 8 feet wide by 50 feet long, well under ground, clear below any possible freezing. He finds the temperature of 45 degrees is correct.

He likewise prefers colonies in Jumbo hives, as he says it is clear that they swarm less, and come out in the spring much better than those in the standard Langstroth hives.

Probably, if the truth were told, Mr. Caraway went north because he could get some good hunting by so doing. He has some wonderful trophies that he secured after the bee work was over. It is hard to understand how a good beekeeper could leave the balmy Southland for the cold, cold North, where the temperature goes 40 below zero in winter and then turns to boiling hot in the summer.

B. M. Caraway and his helpers and truck with a load of bees ready to start for an outyard—Mr. Caraway at the wheel.

GRANULATION IN COMB HONEY

The Probable Cause of It and a Suggestion as to How This Granulation Can be Avoided

By J. E. Crane

Why honey in filled sections will granulate more quickly, if the sections contain comb drawn out the previous year, than if the combs are drawn from foundation the current season, is a question that seems somewhat difficult to explain, yet the subject is one of considerable importance to producers of comb honey.

By the 15th of June clover is usually coming into bloom, everything looks promising, and hundreds of supers go on to our hives. Then, perhaps, hot dry weather sets in, and by the time the supers are half full the flow of honey fails, and, instead of some thousands of salable sections, we have thousands of sections from one-fourth to three-fourths full, with only a small number fit for the market. Or it may be that the close of a fairly successful season catches us with a large number of unfinished sections. A part of these may be used profitably as bait sections; but, if entire supers of these are used, the resultant honey must be sold as an inferior grade, owing to its greater liability to granulation.

In order to produce honey in the half-filled sections that will not granulate the following season, must we extract the honey, break or cut out the combs, and melt up for wax and refill with fresh foundation? If we only knew the reason why honey in sections of comb drawn the previous season is more inclined to granulate than in combs recently drawn out from foundation, we might in some way avoid the difficulty and so use our last year's half-filled sections very much to our advantage. Bees will occupy and fill these a great deal quicker than they will supers filled with foundation.

My Experience With Granulation.

During the season of 1915 we had a fair crop of honey; but the quality was not so good as in previous years; and, what was worse, it began to granulate early, and there seemed to be no end to this trouble. We had used some sections with drawn combs, but the tendency of the honey to granulate did not seem to be confined to such sections. I noticed also that combs most inclined to granulate seemed to contain more or less light-amber honey, evidently something besides clover. Moreover, I found some combs were free from granulation, except perhaps an inch or so at the bottom of the section where it was solid; while others might be granulated at the top, but not at the bottom. Another thing I noticed was that those combs that contained pure clover honey did not granulate.

A Possible Explanation.

These observations led me to conclude that the tendency of honey to granulate does not depend nearly so much on the age of the comb as on the kind of honey with which it was filled. I remembered that, during the spring of 1915, there had been an unusual flow of honey from dandelion bloom. Indeed, most of the hives were packed with dandelion honey. Few hives had enough room for brood. As clover bloom opened, the hives were given supers; but the yield of clover honey was light, and a large amount of dandelion honey was carried up into the sections to make room in the brood-chamber for the queen. This accounted for the large number of sections containing honey of a light-amber color, it being a mixture of clover and dandelion. The fact that dandelion honey granulates quickly after being gathered accounts in part, at least, for the unusual amount of granulation in this locality during 1915.

My Guess Corroborated.

At the close of the season of 1915 we had a good many unfinished sections. The honey was extracted from these, and the combs of the poorest were cut out and melted up for wax, while the whitest were saved to be used again next year. These were not used as bait combs; but, after marking with a pencil every section containing drawn combs, the supers were filled with them and they were used on the hives the same as sections of foundation.

The season of 1916 in this vicinity proved very good for clover. There was a fair yield of dandelion honey that was quite largely used for the production of brood. Surplus from clover was not stored until after June 25, with the result that not much dandelion honey was carried up into the supers; yet a few colonies stored some. It was late in August when one of our men cleaning sections exclaimed, "What is the matter with this section?" "Why, that has begun to granulate," I said, and I took the section and looked it over to see why it should granulate so quickly. Was it a section containing a last year's comb? Not at all. It was a comb built new this year. What kind of honey? It was amber, the same, apparently, that made us so much trouble last year.

We have found some combs since where early granulation had set in, but apparently without the slightest regard to the age of the comb; but in every instance in sections or combs with light-amber colored honey, which, without doubt, was largely dandelion. So I am more than ever convinced that my theory concerning the cause of granulation is not far from right.

The reason the same kind of honey granulates more freely some years than others may be because a small quantity of another kind is mixed with it—enough to work mischief, but not easily detected either by color or flavor. Some one will ask, "Why is it that bait sections are more liable to granulate than others?" I answer, because the foundation, being already drawn out, bees are more liable to store early-gathered honey in these than in those that must first be drawn from foundation.

Best Sections from Bait Combs.

But why are these bait combs so much darker than those drawn from foundation? Combs, as we all know, will darken with age; and, if kept over, and filled and sealed, without the addition of new wax, will appear very much darker than new combs. In some way bees seemed to have learned the scriptural injunction about putting new cloth into old garments. At any rate, they seem to hesitate about adding much new wax to last year's comb. To overcome this difficulty I have been in the habit of cutting down old combs so they will not be more than three-fourths of one inch thick. This literally compels them to add new wax to lengthen out the cells and then cap with new wax, giving them a nice appearance. I have had such combs the past season that went in with my best grade of honey. Such combs should be used preferably only when the best grade of honey is coming in, so as to be out of danger of getting mixed with dandelion or other honey that granulates soon after being gathered.

Middlebury, Vt.

SWARM CONTROL

Removing the Queens Without Finding Them. A Simple and Practical Way of Checking Swarming in Comb-Honey Production

By F. G. Rauchfuss

In order to follow out the plan described below it is quite necessary to begin operations the latter part of the honey flow, so as to have the colonies of sufficient strength the next spring. In most cases this can be accomplished by wintering in double-story hives, making sure that the colony has plenty of honey and bees. One very essential point is to have a good strain of bees—bees that will winter well and raise an abundance of brood, so that a double-story hive will be none too large for them. If colonies are strong in the latter part of the honey flow, instead of putting on the last comb-honey super and running chances of not getting the sections finished and in many cases getting them stained more or less, a set of combs may be put under the brood-chamber, which at the end of the honey flow should be quite well filled with honey and brood. If colonies are not strong enough for two stories at the close of the honey flow, it is advisable to double them up. If colonies have been handled properly in this manner, in all probability they will come thru the winter quite strong, thereby giving them a good opportunity of gathering the early pollen and nectar which are of great benefit to them in building up.

Now assuming that the bees had been prepared in this manner and are in two-story hives in the spring, leave them this way until they have both chambers well filled with brood and the upper chamber quite well filled with honey, except the space occupied by the brood. Some colonies in this condition will have queen-cells started; if queen-cells are to be grafted, this is the time to do it.

Assuming a colony in this condition with no cells started, remove the upper story; then on the lower chamber place a super, or two supers if the honey flow is heavy enough to warrant it; then place a bee-escape board on top of the super or supers; put a piece of queen-excluding zinc over the hole in the bee-escape board; and finally put the upper chamber on top of the bee-escape board. If the upper chamber has enough bees to work in a super, place one on top, being sure to provide a flight-hole in the upper chamber.

If a colony has cells started, cut out all queen-cells from the lower chamber, and place a super on this chamber or two supers should the honey flow justify it. Next, place a bee-escape board on the super or supers; put a piece of queen-excluding zinc over the hole in bee-escape board; then set the other chamber on top of the bee-escape board as before. If queen-cells are not to be grafted cut out only the sealed queen-cells in this chamber, and place the queen in the lower chamber. If the queen in this colony is not good enough to rear queens from, cut out all queen-cells, and in this case it is immaterial whether the queen is above or below. If the colony is very strong put another super on top of the upper chamber, put on the cover, and provide a flight-hole in this upper chamber.

Eight days later when the next visit is made, first treat the colonies in which unsealed cells were left in order to secure select queen-cells. Now remove the upper chamber and super or supers under this chamber and take away the lower chamber which has the queen, moving it to a new location. Next, the chamber that was on top is placed on a bottom-board on the old stand and all queen-cells but one are cut out, using precaution in doing so, as these are mostly ripe cells from select stock and they will be needed in the other hives that had no queen-cells on the former visit. Next place the supers on this chamber, being sure to provide plenty of super room.

By removing the hive containing the queen to a new location most of the field bees will go back to the old stand; and in most cases it is not necessary to cut out the queen-cells in this hive, as the bees will generally eat them out. This colony, by losing the field bees, has a splendid opportunity to rear brood, as they will gather very little honey for some time. The queen will now have a chance to keep the hive filled with brood and this colony should be in fine shape for a later honey flow. The young queen from the cell in the hive left on the old stand should begin laying within about 12 days, and there should be very little trouble with swarming from either one of these hives.

With the colonies that had no queen-cells on the former visit, the first thing is to find out which chamber the queen is in. This can be easily determined by examining the brood in the upper chamber; if there is no young brood, she is below. Then proceed as with the other colony, with the exception that when treating the chamber left on the old stand, all queen-cells should be cut out and one of the ripe queen-cells saved from the other colony should be given. If cells have been grafted from select stock, use one of these or a virgin queen. Should the queen happen to be in the upper chamber when the examination is made, move that portion to a new location, the essential thing being the removal of the brood-chamber containing the queen.

Englewood, Colo.

COMB HONEY PRODUCTION

Swarming Greatly Reduced by Better Bees, Better Hives, Better Combs, and Better Management

By Geo. S. Demuth

IN most localities suitable for comb-honey production on a commercial scale, swarming is one of the most difficult problems with which the comb-honey producer has to deal. The intensity of the swarming tendency varies greatly in different localities, during different seasons in the same locality, and in different colonies in the same apiary during the same season. It is apparently greatest when colonies build up most rapidly to great strength in the spring, as is usually the case in the far North, especially if a moderate honey flow comes on at the time the colonies have the greatest amount of brood. It is usually less troublesome when colonies build up more slowly, especially if the weather conditions permit the bees to work freely in the fields every day. Under such conditions as in the tropics, the swarming season may be long drawn out, sometimes lasting several months; while in the far North it is usually well defined, most of the swarming often occurring within three or four weeks.

These differences in the intensity of the swarming tendency have led to much disagreement among beekeepers as to the best methods for swarm control; but, as the reasons for the differences become known, they throw considerable light upon the conditions under which bees may be induced to apply themselves to energetic work instead of swarming.

Preventive Measures.

Much time and energy have been spent in the attempt to breed out swarming by selecting breeding queens from colonies less inclined to swarm, with the hope of finally developing a non-swarming strain. While after years of selection swarming has been reduced, these carefully bred strains continue to swarm when conditions are favorable, swarming or a lack of swarming apparently being brought about more often by conditions in the environment than thru heredity.

Many attempts have also been made to construct a non-swarming hive, but at present there is little if any ground for hoping that swarming can ever be controlled completely by means of the hive alone in the practical production of comb honey. From all the experimenting along these two lines much has been learned, enabling beekeepers to reduce swarming by better bees, better hives, and better combs.

Influence of the Hive and Combs.

Previous to the honey flow, swarming can usually be prevented by supplying ample space for brood-rearing, using two stories when necessary. The better the combs, of course, the more room there is in the brood-chamber for brood-rearing and the greater the freedom in expanding the brood area. Colonies which have less than 60,000 cells available for brood-rearing are more inclined to swarm than colonies having more. Colonies which have barriers of imperfect comb between the areas of good comb are more inclined to swarm than colonies having perfect brood comb thruout the brood-chamber, permitting the free expansion of the brood-nest without interruption.

Colonies in hives which afford less comfort for the bees are more inclined to swarm than colonies in hives which afford them greater comfort. For this reason ventilation, shade, and even the color of the paint on the hives influence the tendency to swarm. Thus while in practice swarming can not be prevented entirely by means of the hive and combs alone when producing comb honey, the amount of swarming can be considerably reduced by providing ample space for brood-rearing, good combs, and comfortable hives. Even the location of the apiary has its influence upon swarming. Colonies located in a hot nook where the breeze is almost entirely shut off are more inclined to swarm than those located in more comfortable quarters.

Distribution of Bees Thruout the Hive.

Apparently anything which causes too many bees to crowd within the brood-nest, tends strongly to bring on swarming regardless of the total number of bees in the hive. Therefore any condition which affects the distribution of the bees within the hive, has its effect upon the tendency to swarm. Colonies which have a large proportion of emerging bees and bees too young to go into the supers or into the fields, are more inclined to swarm than colonies which are able to send most of their workers into the fields and the supers during the heat of the day, leaving only enough bees in the brood-nest to do the necessary work there. Colonies of medium strength which confine their work largely to the brood-chamber at the beginning of the honey flow are more inclined to swarm than stronger colonies. Colonies in which the super workers are crowded back into the brood-chamber as the combs in the sections become fully drawn out before an additional super is given, are more inclined to swarm than colonies which are furnished additional room before any of the super workers are crowded down. Colonies in which the super workers are forced to go back into the brood-chamber because the supers become too hot, are more inclined to swarm than colonies having the supers protected by shade-boards or covers painted white, which begin super work with a rush. Colonies which at the beginning of the honey flow have a rim of sealed honey between the brood and the supers, are more inclined to swarm than colonies which have brood practically to the top-bars of the brood frames.

Influence of Idle Field Bees.

Apparently any interference with the work within the hive, such as discomfort from heat, lack of ventilation, lack of room for incoming nectar or congestion of the brood-nest by young bees which should be in the supers, is immediately reflected in a slowing down of the work of the field bees, causing them to stay at home in greater and greater numbers, thus increasing the congestion and discomfort and usually resulting in preparations for swarming. In this way a small beginning in temporary discomfort, lack of room in the supers, or conditions which do not attract the idle younger bees into the supers, may quickly develop into a sluggishness of the work of the entire colony and bring on swarming. After this condition has once started it is difficult to break it up, even tho the cause is entirely removed. This is where "an ounce of prevention may be worth several pounds of cure." Colonies in which the field workers are compelled to stay in the hive during the heat of the day on account of showers or erratic yielding of nectar, are more inclined to swarm than when the field workers can work in the fields thruout the day. A few days of rain in the midst of the early part of the honey flow is often followed by intense swarming, especially if the temperature continues high while the field bees are forced to stay at home.

The tendency to swarm is least in those colonies in which the younger bees are attracted into the supers to the greatest possible extent and the greatest possible number of field bees are at work in the fields, leaving during the warmest part of the day only enough bees within the brood-chamber to take care of the work to be done there. Apparently the greater the activity within the hive among the hive workers, the greater the number of bees sent to the fields, and the only way to prevent loafing among the field bees during the honey flow is to prevent idleness of any of the hive workers. In the production of extracted honey this is not difficult to accomplish by providing supers of empty extracting combs a little before the bees need more room thruout the season, but it is more difficult to accomplish when producing comb honey.

Much can be done, however, to prevent the beginning of the train of events which lead up to the issuing of a swarm, and the comb-honey producer can not afford to neglect any of the important preventive measures suggested above, for by careful management the percentage of colonies that prepare to swarm can be greatly reduced even when producing comb honey. Usually the greater the percentage of colonies which can be induced to work vigorously thru the season without swarming, the greater the crop of honey at the close of the season.

No Swarming Previous to the Honey Flow.

Previous to the honey flow, swarming can usually be prevented by giving each colony plenty of empty combs. An extra story of combs partly filled with honey usually furnishes an excellent safety valve to hold down early swarming, as well as acting as an automatic feeder. If the colonies were wintered in single stories, the second story is usually more effective in preventing swarming when placed above than when placed below, and dark combs which have been used previously for brood-rearing are better for this purpose than new combs. The greatest objection to the use of two stories at this time for comb-honey production is the necessity of shaking the bees from the extra set of combs to reduce the hives to a single story at the time the first comb-honey supers are given, but the stronger colonies now obtained by up-to-date beekeepers can not well be managed as to early swarming without the use of a second story, or at least a shallow extracting super during the spring.

Critical Period When First Supers Are Given.

When the two-story hives are reduced to a single story at the beginning of the honey flow, and most of the brood is put into this one story filling it almost completely with brood, the colonies are usually forced to enter the supers at once; but, unless they enter the supers and draw out the foundation immediately, the crowding of a two-story colony into a single story may result in the starting of queen-cells preparatory to swarming. A few bait combs in the first supers may be necessary to prevent this, but having the colonies strong and using full sheets of fresh foundation are important factors in a prompt beginning of work in the supers. It is sometimes best to give two comb-honey supers at once to colonies which have been reduced from two stories to a single story. After work has once been started in the supers it is not difficult to induce the bees to expand their work into additional supers, as more room is needed if each additional super is given in time.

Remedial Measures.

The beekeeper who is operating a single apiary and can just as well spend the swarming season among his bees, should secure excellent results by discouraging swarming as much as possible, then permitting those colonies which insist on swarming to swarm naturally, hiving the swarm on the old stand, transferring the supers to the swarm, moving the parent hive to one side and a week later moving it away while the bees are well at work in the fields to deplete it of its working force, thus preventing after-swarming and at at the same time adding these extra bees to the swarm where super work is in progress.

The beekeeper who is operating out-apiaries, or the beekeeper who is away a part of the time during the swarming season, can not well permit his bees to swarm naturally. In this case each apiary must be visited and the colonies examined for queen-cells about once each week during the swarming season; or all colonies must be treated for swarming before swarms begin to issue, regardless of whether queen-cells are present or not.

If the weekly-visit plan is used when queen-cells are found which contain only eggs or very small larvae, these cells may be destroyed and the colony left another week. Sometimes they will give up swarming when this is done, but often they build more queen-cells immediately and will be ready for treatment at the time of the next visit a week later. When destroying queen-cells in this way it is necessary to shake most of the bees from the combs to be sure that none of the cells are overlooked, for if one is left a swarm may issue before the next visit.

If well-developed queen-cells are found, destroying them will probably do no good, and the colony must now be treated. Just what remedy is best depends so much upon the character and advancement of the season, as well as upon the condition of the colony, that no set rule should be followed blindly. In some cases taking away the brood, leaving most of the bees, the queen and the supers together in the hive on the old stand as in hiving a natural swarm, gives best results. When this is done the removed brood, together with enough bees to take care of it, is placed in an empty hive; and this hive is now treated as the parent colony in natural swarming, care being taken to see that it is supplied with a good queen-cell, one that has not been injured by shaking the comb.

In other cases the queen should be removed or killed, all queen-cells destroyed, and the colony left until the tenth day when all queen-cells should again be destroyed and a young laying queen introduced.

Colonies treated in this way are comparable to the parent colony after all swarming is over and the young queen has mated and begun to lay, except that its full working force is retained. Thus by creating conditions, either comparable to the swarm or comparable to the parent colony, swarming can be controlled in out-apiaries when producing comb honey. Many variations have been worked out for each of these plans, but the basic principle remains the same thruout the various methods. The removal of the brood usually gives better results during a short rapid honey flow, as frequently occurs in the clover regions; while the removal of the queen usually gives better results during a prolonged honey flow, as in the alfalfa region of the West.

PREPARING for the HONEY FLOW

Importance of Having Enough Supers to Take Care of Exceptional Yields

By E. F. Atwater

Hands up, all you who have never lost honey by having too few supers, or by other lack of preparation for exceptional flows. Not many hands go up.

The writer has tried to avoid such losses, or reduce them to a minimum, and in spite of occasional criticism by others because of the magnitude of such preparations, yet losses have occurred at times.

This past season we put up over 700 new dovetailed hive-bodies with frames, besides one or two hundred new hive-bodies not used the previous year; then there were about 300 hive-bodies filled with old frames, and nearly all, old and new, were put in use, to handle the heavy honey flow.

The cut shows most of the new hive-bodies piled up and being painted. Note the ventilator hole in the end of each hive-body, and the cleats, ½ by 2 by 16 inches, across the top of each, reinforcing the weak strip left by the cutting of the rabbet in which the frames hang. No hive is complete without these reinforcing cleats. They extend down 1/32 of an inch below the upper edge of the hand-hole, thus giving a far better grip or handle, than the hand-hole alone.

Nor do these cleats interfere with piling or loading, as they extend clear across, and merely require a little more room, as each body is one inch longer than when cleats are not used. After years of use of thousands of hive-bodies with such cleats, I cannot urge too strongly their value and importance, for hive-bodies so reinforced and strengthened are far less easily damaged.

We were a little late in getting our little home extracting-plant ready for use, but for some weeks we ran two eight-frame extractors, from the single two-horsepower electric motor, and we finished the season with the largest crop and the largest per-colony average that we have ever taken, together with about 300 colonies of increase, leaving nearly every colony with four or five full combs of honey, in addition to the amount stored in the brood-nest.

This leaving a heavy supply of honey is

one of the most important steps in the preparation for a big crop the following season, and is our invariable practice. It pays well, as the bees breed more freely when spring comes, the beekeeper does not need to worry about any lack of stores, and spring care is reduced to a minimum. As soon after our last honey flow as possible, we reverse the position of the two stories in which the bees are wintered, so the bees and brood-nest are at the top. The bees then carry up honey all thru the fall, from the combs below, and store it in the brood-nest. In spring, when one story is fairly well filled with brood, the super is put above, but should not be put above too early where nights are cool.

If we were again producing comb honey by the carload, we would try to devise a plain, simple super which could be cleaned by passing it thru boiling lye water. The lye, however, is fatal to paint; but would not the lye act as a preservative of the wood, even if the supers were not painted? I know how weeks are sometimes spent in cleaning comb-honey supers ready for refilling; while, if they can be boiled, this time could be very greatly reduced. I tried boiling the ordinary section-holders, but they are easily loosened up, so they need renailing. There have been marked improvements in methods and apparatus utilized in the production of extracted honey, but the comb-honey producer has nothing of importance better than the plans and implements of 20 years ago. Better apply a little preparedness to the production of comb honey, by devising simpler and better apparatus and machinery to speed up the work of producing, and preparing the crop of comb honey for market.

The producer of extracted honey who is not located near a can factory had best have tanks to hold a large part of his crop, and, if a uniform product is desired, large tanks are best. Our largest holds about 12,000 pounds, and we like it; but for a smaller business, tanks holding about two tons are very convenient, and be sure that they have large honey-gates.

Unless you have far more hives than you need for full colonies, you had better prepare a lot of five-frame standard nuclei; then by establishing nuclei, you are always ready to save any first-class queen-cells which you may find. If you do not at once need the queens so mated, their colonies can be allowed to build up fairly strong. If no increase is desired, a frame of emerging brood can be drawn from each, and added to the producing colonies occasionally, as long as the bees so added will be producers; or, the older queens may be killed and the entire nucleus colony set down in the middle of the colony where you have just killed the queen, and the young queen, being at first among her own bees, will usually be accepted if this is done in a fairly good honey flow.

Painting supers. E. F. Atwater, Meridian, Idaho, preparing for a big honey crop.

Meridian, Idaho. E. F. Atwater.

FROM THE FIELD OF EXPERIENCE

VALUE OF GOOD QUEENS

Why Beekeepers Should Rear Their Own Queens

From the days of Langstroth and Quinby down to the present time the masters of beekeeping have pointed out the importance of the queen in relation to successful honey production. It is a well-established fact that a good queen is necessary if a honey crop is to be secured. Yet it is doubtful if many beekeepers fully realize the importance of having a good, young, vigorous Italian queen at the head of every colony at the proper time, so that the colonies will be strong and the hives filled with brood and fairly boiling over with bees just as the honey flow opens. When this condition prevails, a large yield is assured, provided there is anything like a good honey flow. In any apiary of any considerable number of colonies will be found colonies that produce those phenomenal honey crops, double or quadruple the average of the apiary. Many other colonies will be found that produce little and some that give no surplus whatever. My personal opinion on this matter is that too many of us are prone to believe these yields, both large and small, are due to some peculiar honey-getting qualities of the bees, or the lack of such qualities. In most cases, if a careful examination were made of these exceptional colonies, it would be found to be the **condition** of the colonies rather than any inherent quality of the bees. And further, it would be found that the age and the quality of the queen are responsible for the condition of the colonies. By the quality of the queen, I mean that she was properly reared, which is usually the case where she was reared under the swarming impulse or during supersedure. To be sure, there is a difference in honey-getting qualities of bees, but the age of the queen has most to do with it.

To realize the importance of having young, vigorous queens in all colonies, the beekeeper may make the following test. At the close of an ordinary season, figure up how much honey you got per colony. Then figure up how much more you would have gotten, if every colony had done as well as the best one. Many would find that their income would have been doubled, as the expense and the work connected with a poor colony are about the same as with the best one. Now if you had as good queens in all colonies as the one in the best, your yield per colony would have equaled the best. But some will ask, "Is it possible or practical to have all queens equally good?" What is there to hinder? It is no uncommon occurrence for beekeepers to report that the average per colony was above what their best produced several years before under similar conditions. They had become better beekeepers and had all colonies in better condition, altho they had not bred a better strain of bees than the ones they previously had. How then are you to proceed? There is only one way, and that is to **rear your own queens.** It would be impossible to buy enough queens to requeen as often as necessary, even if it were advisable. I believe the time will come when most honey producers will consider as a regular and necessary part of the work of the apiary, that of rearing queens. The era of better beekeeping is coming, and we can hasten it in no way more than by rearing our own queens if we know how, and if we do not, we should learn.

It is gratifying to see the number of agricultural colleges that now teach apiculture. They cannot do a better service than to give an extensive course in queen-rearing. Graduates would be in demand, for in many cases the beekeeper could afford to hire a graduate to rear his queens and requeen his entire yard, if he were not in position to do it himself. Jay Smith.

◆

COLOR OF DRONES

American-Bred Italians More Uniform than Imported Stock

Regarding the article of E. P. Stiles in March Gleanings, page 150, on the color of drones from imported queens being more uniform than from American-bred queens, I will say, after over 30 years of study and comparison of drones from imported Italian queens and from what other close observers have told me, that our American-bred queens throw more uniform drones than do the imported stock.

I have never yet seen an Italian queen of known purity throw drones that were uniform in color. If they are yellow, there is always a variation in the shade of yellow. This leads me to believe that the Italian bee is not a pure strain or race of bees. Like the Plymouth Rock poultry, it is necessary to breed for color all the time. The variation in color is not only in the drones but in the queens as well.

It is surely a fact that the pure Italian stock which we imported years ago reverted back to dark or black bees very quickly if they were left alone and no pains were taken as to color. This is a fact up in this northern section anyway, so we still select for color. I think Mr. Stiles means dark-brown, and not black drones.

Sacket Harbor, N. Y. Geo. B. Howe.

FROM THE FIELD OF EXPERIENCE

NATURAL SWARMING

Some Advantages in Permitting Bees to Swarm When Producing Comb Honey

In our good seasons where colonies breed up early, some are apt to swarm before the clover flow. Even in 10-frame hives they may swarm by the middle of May, whereby the working strength of these, our best colonies, is nearly all lost. When producing comb honey it was a common practice to take out a frame or two of brood from such colonies and fill in with empty combs, giving the removed brood to a weaker colony. This is a mean trick. Why not conserve the strength of these colonies by giving more room for the queen, by adding a shallow chamber of good brood combs, and have these colonies growing stronger for the honey flow, the same as if running for extracted honey? By so doing we ought to get big returns from these colonies, and have something to brag about the rest of the year.

I don't think it pays to bolster up weak colonies. In early spring I double up all weak colonies. After that I preserve the individuality of each colony, and see to it that no colony has acquired the swarming fever by the time the clover flow opens. Putting on section cases early will not help. They must have a place to put brood, or honey that may be moved to give more room for the queen.

Colonies that have not acquired the swarming fever before the honey flow may not start queen-cells for some time; and, when they do, ordinarily the swarm will issue about eight days afterward, or when the cells are capped over. This gives time for some good work in the sections.

But in the meantime about 60 or 70 per cent of the colonies in the yard are getting ready to swarm, and I am not going to hinder them. Why? For a number of reasons. First, we expect a good fall flow. I want two colonies instead of one for that, and there is plenty of time between flows for building up to gather it. After I put on the section supers, I will not hinder in any way the "will to work," which I may have created, or the effort to carry out nature's law of increase, because they are doing their best, both in brood-rearing and honey-gathering. Do the wrong thing at this time and see how the bees will sulk. I will not take any brood from a colony before it swarms, as it needs it all. I will not overhaul a colony and pick off queen-cells to keep it from swarming, for to do so does not prevent swarming; besides, overhauling the whole yard every few days is too much labor.

All young bees from eggs laid after June 10-15 will not gather any white clover honey, and most of them will have died before the fall flow opens. These bees are boarders. After swarming the queen will occupy only the minimum space, not more than two-thirds of that needed before swarming; hence, less brood to care for and more honey in the sections. Again, for several days previous to swarming, the queen slackens egg-laying and will not lay any to speak of until the third day after swarming; but honey is being stored rapidly, and should go into the sections, not the brood-chamber. Hence, I hive the young swarm in a rather small brood-chamber, less than 7-Langstroth frame capacity, just enough for the queen. I want the white honey in the sections at this time.

Over the brood-chamber I place a queen-excluder, then one or two section cases, and the unfinished work from the old hive is placed over all. The old hive is moved to one side and the swarm is placed on the old stand. Now I have the added impulse to work to build the new home, and no brood to feed for six or seven days.

Earlier writers treated a colony after swarming as two colonies, and tried to make each store comb honey. Yet the honey flow is over before any young bees can emerge from eggs of the young queen. We have only a divided colony, and I am going to handle it as such. I want the old hive weakened so that it can build up only for the fall flow. This does away with after-swarms.

I never read of a good plan to utilize "boarders," the surplus bees at the end of the honey flow. But 40 years ago Rev. O. Clute of Iowa City, Ia., said to me: "I divide the brood and make two colonies and let them build up for winter." I know he did that, for that spring he had sold $1,400 worth of increase. Roland Sherburne.

Lone Tree, Iowa.

HOSPITAL YARDS

Precautions and Suggestions on the Treatment for American Foul Brood

A big step toward the eradication of American foul brood could be made if every beekeeper would absolutely avoid the shaking treatment of diseased colonies in an apiary of mostly healthy stock. In large yards, this very procedure disseminates the disease just about as much as tho one were to open a diseased hive and allow a dozen other healthy ones to help themselves. According to my theory, when the shaking treatment is applied, the colony so treated is thoroly demoralized by smoke and manipulation, causing many bees to take wing; and in their frenzy they drift into other hives and present to the household their contaminated honey. Of course, the treatment of one or two colonies at the proper time may not necessarily cause this condition, but when it comes to half a dozen or more, the manipulation becomes far-reaching.

Every beekeeper that discovers disease in his yard should immediately hunt out a location some three miles or more from all other bees, and designate it as a hospital yard. He should then carefully inspect every colony for disease and mark those that have any cells showing American foul brood. That same evening, after all the flying bees are in for the night, the entrances of all the diseased stock should be screened and every hive hauled to the hospital apiary. About a week later another thoro inspection should be made of the entire apiary or apiaries, and all stands showing any infection should be treated in a like manner. If there is a honey flow on, it is then the appropriate time to go to the hospital yard and apply the shaking treatment to every colony within the yard. In about 10 days these colonies can be taken back to their respective locations, assuming that they have been cured. The big idea is always to get the infected colonies into the hospital yard immediately upon discovery of their diseased condition. Bees drift more or less at all times during the flying season in large yards with hives of similar appearance and surroundings, and it is this drifting that eventually spreads the disease to a certain degree.

It would be a great thing in localities where there are many beekeepers, if they would all co-operate along this line. Hospital yards could be designated in locations easily accessible to the majority of the producers. All diseased stock could be placed in the community hospital, and a certain day named for all the owners to assemble and apply the treatment to their respective colonies.

Every bee inspector should endeavor to bring about these conditions within the territory directly under his jurisdiction, as it would undoubtedly prove to be a real factor in the curtailment of American foul brood. T. V. Damon.

Yerington, Nev.

[In the eastern States it would be difficult, if not impossible in many cases, to find a location for a hospital yard that is three miles or more from all other bees. In some parts of the West this should not be so difficult; but, in finding a location where there are no other bees, there is danger of selecting one in which there is no honey flow, thus increasing the difficulties in treatment. A more serious objection to hospital yards, so common in some parts of the West, is that the beekeeper does not feel the necessity for extreme care in handling disease as he would if the colonies are left in the main apiary, and, in the rush of other work, too often the colonies in the hospital yard are left untreated thruout the busy season. In some parts of the West the remnant of hospital yards have been apparently abandoned completely by beekeepers who were too busy or too careless to treat the diseased colonies, the owner probably thinking that they are so far away from other bees and so well hidden from the bee inspector that there is no reason for haste in treatment. A sort of community hospital yard, carefully located as Mr. Damon suggests, could, no doubt, be made to work out well in the western States where locations can easily be found in the desert far away from all other bees.—Editor.]

* * *

RETAILING HONEY

Folly of Selling Retail at Wholesale Prices

There have been three or more trips made down thru here by parties from Weld, Larimer, or Boulder counties, selling honey as low as $8.00 for a 60-pound can. These parties make a run of 100 miles or more out across the country along the principal auto road. The people for 20 miles on each side hear of it, and when we come around asking $13.00 for 60 pounds, they think we are robbers. What is the result? There can be but one, and that is, they will not buy of us nor can they get it of the other fellow because he is gone. The consequence is, there is not nearly as much honey used as there would have been if these parties had kept near the regular price, or else sold it to some beeman that lives here and let him peddle it out. I have sold but one 60-pound can for less than $13.00 to consumers, and most of it brought $14.00 up to Feb. 9.

There is a beekeeper near me who sold all his honey before the holidays at $15.00 for 60-pound cans. This man went to a party that was having a hard time getting rid of his honey by cutting prices and asked him what he would take for 1,000 pounds. He replied, asking the same price as by the single can. This beeman that wanted to buy the honey has a good truck and nothing to do; so he thought he could help his beekeeping friend dispose of the honey and also help himself in making wages in peddling it out.

I believe this county could and would use every pound of honey produced in it if properly worked. If I had trouble in disposing of my honey in a retail way at retail prices, I surely would produce less of it, or sell in a wholesale way at wholesale prices. I have never yet had enough to supply my trade, and I buy of others almost every year. R. C. Clary.

Ft. Morgan, Colo.

SIFTINGS

J. E. Crane

It almost takes my breath away to think of a colony of bees consuming 200 pounds of honey, as stated in an editorial on page 203 of April Gleanings, and yet it would seem to be not far out of the way. If such is the case (and I can not doubt it), we see the necessity of keeping as few unproductive colonies as possible.

* * *

Carl C. Johnson, on page 218, gives an excellent method for finding a queen. However, we prefer a light box, a little larger than a brood-chamber, set up on legs about 12 inches from the ground, with queen-excluding honey-board or zinc nailed to the bottom. It is a great time-saver.

* * *

That ''Automatic Feeder,'' mentioned on page 216 by Geo. S. Demuth, is an idea not only worth remembering but putting into practice. It has two distinct advantages over other feeders: It will feed a colony just as it needs feed thru the spring, without further attention from the beekeeper; and, when the feeder is no longer needed, the bees will fill it ready for next year.

* * *

The value of lime in producing clover is mentioned on page 20[illegible]. There has been quite a little difficulty in getting farmers to use it about here, even when lime dust was offered for nothing by a marble-crushing plant near where I live. The action of lime is so slow that it does not seem to be appreciated by the mass of farmers. Alsike clover will grow on land containing but little lime, and even on land somewhat acid. The cultivation of this clover should be encouraged to the utmost.

* * *

It does one good to read the article by E. R. Root on ''The Call of the Southland,'' which gives both sides, the advantages and the disadvantages of a southern climate. Too often only one side is given, and many are the disappointments that follow. How many new things do we find in traveling thru a section of country that we thought we knew all about by reading! It is, I believe, much easier for most writers to tell of the nice things of any section, especially if it pleases them, than to tell of the unpleasant things.

* * *

The season for spraying is again at hand. I wonder how many States have laws forbidding the spraying of fruit trees when in bloom. Dr. A. L. Melander treats this whole subject very fully on pages 210, 211. His description of the effects of poison on the bees is quite true to our experience. I believe the loss to the country as a whole to be much greater than generally supposed. We have lost hundreds of dollars from this cause. Fruit-growers, as a rule, do not yet seem to appreciate the value of bees in their orchards, and quite too many have not yet learned the remarkable value of the Golden Rule. As Dr. Melander suggests, ''Corrective legislation will afford the quickest benefits to all.''

* * *

On page 217, Miss Josephine Morse suggests Milkol as a cheap and effective repellent to be used with poison sprays where there is danger of poisoning bees. Should it prove from further use as effective as claimed, I am sure she will earn the gratitude of beekeepers everywhere. Let us test it very carefully this season. It would not seem to be difficult to do so. Dilute a small quantity of honey with water, say one part of honey to three of water, set this where bees will work on it freely for one day, and next morning set some out with Milkol added in the proportion of one pint to 100 gallons of the spray. Can Miss Morse tells us where it can be obtained? And while we are about it, we might try other repellents, such as carbolic acid or lime-sulphur solutions.

* * *

That is an interesting article by Morley Pettit, pages 204-206. I do not, however, agree with him as to why smoke quiets bees. I should put it in a little different way, and would say, ''Smoke causes fright, and fright takes away all disposition to guard their hives.'' Fear makes cowards of us all. Few are the creatures that can entertain two conflicting emotions at the same time. The frightened horse forgets years of careful training and rushes wildly away—often to its own destruction. Even a frightened army is half beaten. In a very interesting old book, which I possess, I have read how one, Gideon, took 300 brave men, each carrying a trumpet, a lamp, and an empty pitcher, and crept up to a mighty army. Then they smashed the pitchers and with the trumpets shouted, ''The Sword of the Lord and Gideon.'' That great army of Midianites were frightened out of their wits, and ran like a flock of sheep, or a colony of bees before the blast of a Jumbo smoker. Sometimes we find a colony so brave and heroic that smoke does not frighten the bees. What then? Why, we are sometimes the ones to run.

HAPPY HOURS IN CALIFORNIA

CONSTANCE ROOT-BOYDEN

(Stancy Puerden)

SINCE we returned home someone asked me, "Well, do you like California just as well as ever?" Indeed we do, "we" meaning not the editorial pronoun, but including the gentleman who shared the responsibility of counting bags, wraps, and umbrella when we left the train at our various stops. We love the Golden State in spite of the fact that, during our too brief stay within it, many foggy days veiled the mountain scenery, and some rainy days prevented interesting motor trips. I love it in spite of a bloodthirsty flea who inflicted an amount of anguish upon me all out of proportion to his size. (For all I know to the contrary, that flea is still alive, doing his best, or worst, to prevent the tenderfoot tourist from believing California is Paradise, for he was kicking strongly when he rode the whirlpool down the bathtub drain, where I consigned him after vainly trying to crush him with the heel of my shoe as a hammer. If the cat has nine lives, the California flea has a hundred.)

Perhaps if I should try to sum up the things which make me love California so much, it would be in the order named: the mountains, the climate, the perfect highways, and the flowers and fruit. By mountains I mean not only the great, snow-capped peaks, but also the foothills, canyons, and valleys with such wonderful scenery as the Yosemite, which I have not yet seen; and, instead of climate, perhaps the word should be climates; for, because of the hills and mountains and the contour of the ocean with its bays, there is often a fascinating variation of climate within a radius of two or three miles.

SATURDAY afternoon, after the luncheon, given by the Alameda Beekeepers' Association to the visiting beekeepers at the Hotel Oakland, we were invited by friends to accompany them to their home in Mill Valley, a commonplace name for what has seemed a veritable bit of fairyland to me ever since we had a glimpse of it on our way to the summit of Mt. Tamalpais a year ago. To reach Mill Valley we had to take a miniature sea voyage on the ferry from Oakland to San Francisco and another from San Francisco to Sausalito. Those ferries on San Francisco Bay leave with such clock-like regularity, they are so clean and pleasant, the view so delightful, and the bit of salt breeze so invigorating that the commuting business man does not pity himself at all. I have been told by friends who have used the ferry daily for many years that they never tire of it, and that the fresh air does much to keep them well. From Sausalito to Mill Valley is only a few minutes' trolley ride, and the car is always waiting at the ferry.

I must confess that I do not know the distinction between a valley and a canyon, nor can I find any help in the dictionary. Mr. Boyden tried to make me believe that the sides of a canyon are perpendicular or more nearly so than those of a valley; but we have visited many so-called canyons with sides no steeper than those of Mill Valley. My own idea of a canyon is a deep, narrow valley, and with that in mind I should describe Mill Valley as a great, curving, branching canyon with steep, beautifully wooded slopes which rise to a great height on either side, with attractive residences scattered on the steep hillsides and almost hidden by the trees and foliage, and with occasional glimpses of the elusive peak of Tamalpais peeping above the nearer hills. The peak is elusive because it has a way of swathing its neck and shoulders in a chiffon scarf of clouds and mists, hiding the sunshiny peak from those in the valley below; but the peak itself is nearly always in the sunshine.

Our friends have a beautiful home on the steep hillside perhaps 20 minutes' walk from the trolley station. The feminine half of the party took a taxi which climbed a road leading up the side of the hill, while the masculine half walked by a lower road. Had I realized the distance was no greater than it was, I too should have walked, for every bit of that valley is fascinating and unusual to Ohio eyes. As we stopped my friend remarked, "We came the back way to avoid the climb to the house from the road in front." The narrow mountain road on which we stood is perhaps about the height of the second story of the house, which is near the back of the lot, and we had to go down the hill a little way to reach the kitchen door. The kitchen seemed almost on a basement level, as the hill rises so steeply behind it; but, on going thru to the dining room and looking out of the wide window, the ground was so far below that it seemed like a second-story room, as indeed it is, for there is a high basement room below. Now, our lawn in Ohio is so level that there is no slope at all from the basement wall to the street. Perhaps that is one reason why that steep yard in Mill Valley seemed so picturesque to my eyes. It is certain that our friends do not have the problem of keeping a lawn mower oiled and sharp, for their whole lot is tilted at such an angle that one has to climb it from the street in front by a zigzag path interspersed by flights of steps. I believe Mr. Boyden said he counted 50 steps arranged in groups alternating with the aforesaid zigzag path to the front of the house, and there is another flight of steps to gain the entrance porch at the living-room end of the house. At the opposite end of the house are some terraced beds where such plants are raised as do not readily cling to the steep hillside, and another flight of steps alongside leads to the kitchen from the front.

Their nearest neighbors across the road at the back of the house are so much farther up the hill that the basement of one house is about on a level with the top of the other. Across the lower road in front and high up on the opposite hillside showed the gables of another attractive home, but the trees were so thick that not until the lights were on in the evening did we realize how many houses dot the hillsides all the way up to the top. It is all so quiet and peaceful that it seems like a home in the woods.

A fog drifting into the valley threatened to cut short the daylight, so we went immediately out to the steep yard to see the flowers, of which I believe there were over a dozen varieties in bloom, altho it was early in March. It looked odd to see many of my favorites metaphorically digging their heels into the ground to keep from sliding down hill, but blooming just as cheerfully as if they were in my level Ohio garden. Geraniums and calla lilies practically grow wild in most parts of the State, and, while I do not care for the calla lily as a house plant, it is beautiful growing in a hedge which is a mass of bloom. There were pansies, violets, marigolds, camelias, irises, etc., and various shrubs and plenty of trees including oranges and lemons. I couldn't name them all if I tried, because I afterward saw so many other flowers in bloom in other places.

When we finally went into the house it was to wander from one window to another to see the view from the various points. The dining room is especially pleasant. I don't believe I could remember an article of furniture in it, altho I have an impression that it contains the conventional table and sideboard in some dark wood. But almost all one wall is taken up by a wide landscape window, so that from the table one has a wonderful view of the deep valley and high hills beyond. Unfortunately it was dark when we had our evening meal, but even so it was interesting to watch the lights flash out on the opposite hillside as dwellings were lighted. A resident of Mill Valley has the delights of country life on a thickly wooded hillside with the comforts of the city, for I noticed they have electricity, city water, good roads, efficient household workers by the hour, and probably many other conveniences which I did not see.

Among the few regretful memories of our trip is that we could not accept our hosts' invitation to stay over night and see sunrise in the Valley. A taxi had been engaged to come and take us to the car, but it had some accident, so we decided to walk down to the station. Starting rather late we made quick time and incidentally found out the origin of the word "tenderfoot," at least, we believe we did. Having been married to a rapid walker for over a score of years, I pride myself on being able to keep up with him fairly well; but by the time we reached the car the muscles from my knees down felt most peculiar, so weak and painful in fact that I dreaded the car step and felt sure I should not be able to change ferries and walk thru the long corridors in the large hotel to our room, and as for walking the two or three blocks from the car terminal in Oakland to the hotel I just knew I could not do it. But on comparing notes I discovered that Mr. Boyden was suffering very similar symptoms, and we decided that walking down steep grades calls into action muscles which are seldom used in a level country, and that the ability to take the steep down grades at a rapid pace is one advantage the westerner has over the tenderfoot. I might add that we did regain our hotel room without the aid of an ambulance, but our efforts to walk with dignity and ease were about as strenuous as those of a drunken man.

IN our drives thru the various bay cities we saw many other ideal residence sites, in the Berkeley hills, in Piedmont, and in small canyons in the hills. I imagine the frequent fogs, which do so much to keep this region cool the year around, are very beneficial to vegetation, for the flowers and shrubbery are wonderful, not only around the homes but on the grounds of the University of California, which has such a picturesque location against the Berkeley hills. The Scotch heather was especially fine, and I thought the wild lilac even more beautiful than the cultivated variety. Around many of the homes in Piedmont I saw charming color schemes of lavender shrubs, purple and lavender cinerarias (which are greenhouse plants in the East), pansies, and violets.

Speaking of flowers, I never think of San Francisco without recalling the displays of flowers on stands at nearly every corner, even in the downtown business and wholesale districts and in the great ferry house. It is much the same in Los Angeles; but in the cooler climate of San Francisco it seems a little more remarkable, and Mr. Boyden tells me that it is the same the year around except that the varieties of flowers vary with the season.

As an instance of the fine roads, a friend took us, together with his wife and two little daughters, for an afternoon drive of 134 miles thru the Santa Clara Valley and back for dinner at his home, and we were not one bit tired. We went thru San Jose, beautiful Los Gatos in the foothills and Saratoga and called on friends who raise prunes and apricots and have a gorgeous

(Continued on page 309.)

Beekeeping as a Side Line

Grace Allen

As he watches a colony of bees thruout a year, the sideline student is impressed with four important outstanding activities. These are brood-rearing, the storage of honey, swarming, winter-clustering.

Brood-rearing in a normal colony begins in late winter and continues increasingly into early summer; then decreasingly thru late summer into autumn, when it ceases.

Nectar-gathering depends, of course, upon the presence of nectar in the fields or forests. It usually begins when the earliest spring flings the blossoms of the elms and red maples against the cloud-filled skies of February and March. It, too, continues increasingly into the spring—increasingly, yet not continuously, for often there are periods of practical dearth, as just after fruit bloom. It reaches its peak in the white-clover section when that most important plant itself comes into full bloom in May or June, decreasing as it wanes. It continues, however, with some irregularity, thruout the summer and fall, closing only when the early frosts finally become definite freezes and so write **finale** on the late-blooming asters.

The swarming tendency is chiefly characteristic of spring and early summer. Under certain conditions swarms appear either earlier or later, but May and June are the months most likely to see them issue.

Clustering is a phenomenon of winter. It is the normal method of heat conservation in the hive.

In reviewing the history of a colony, it is customary—and wisely so—to begin with the spring, when activity recommences after the long winter. Everything in the hive at that time is at low ebb—not many bees and not much honey. Brood-rearing, however, has already begun. For even before the first nectar appears in the earliest blossoms, the queen has started laying, so even by early spring there is brood in various stages in the guarded brood-nest at the heart of the hive, where the temperature is maintained fairly evenly at 95 degrees F. or a little less. In concentric rings she has deposited the tiny ivory specks, these rings growing constantly larger and appearing on more and more combs. The rapidity of this increase depends upon the amount of stores in the hive and the number of bees to care for the brood. As the earliest laid eggs complete their final development and emerge as bees, they leave empty cells ready for more eggs, while the new bees themselves add strength and numbers to the working force of the hive. Thus the brood-rearing activity can be rapidly increased and the brood-nest expanded.

For about the first two weeks of their lives these young worker bees are unable to take the long flights to the field for nectar, or for pollen or water. So at this age they are the nurses, faithfully feeding the larvae; or they hang, a living consecrated curtain, producing the mysterious wax in what seems a very ecstasy of motionless effort; and they do the cleaning of the hive and the ventilating, and other home duties. When about a week old, wings are strong enough to allow them short flights around the hive. Beekeepers speak of the ''play spell'' of the young bees, when in the warm hour of the day they fly and hum so thrillingly around the entrance. And it has the feel of play, somehow, even tho it may be a fairly serious business, by which they not only gain strength but also become so familiar with their hive that they can readily locate it when a little later they come hurrying home from clover fields or blossoming trees. When they are about two weeks old, they begin this great work of their lives, garnering and storing the life-sustaining sweet hidden in living beauty. And still, while they pass thus from duty to duty, the queen continues to deposit eggs for still more workers; and eggs, also, to produce drones.

Then soon the day will probably come when the colony will be uncomfortably populous. And preparations for swarming will begin. Those who have studied these matters with that thoro-going, cool, definite precision that mere enthusiastic lovers sometimes lack, make no claim to understand positively the real scientific cause of swarming. But the general impression is that with these great numbers of young bees coming out every day, one or two or three thousand a day, things get crowded; perhaps, too, there isn't enough to do at home to keep these youngsters busy. At any rate, it is usually (not always, however) at about this time—May and June—thousands of young bees emerging daily, the queen laying heavily and nectar coming in rapidly—that preparations are made for swarming. This swarming instinct is most unique. In the natural state this is the only way new colonies are formed and the race perpetuated, perhaps increased. And the swarm itself is something more than unique, it is strangely thrilling and exciting and beautiful. And often—let us be honest—inconvenient—aye, and unprofitable.

The first step the bees make towards casting a swarm is the building of a goodly number of queen-cells. These are large and long, and in each one a tiny egg develops into a larva, which, fairly swimming in a wealth of royal jelly, grows to a size to be sealed over. Usually when one or two of these first cells are sealed, comes the great day. And when the sun is high, probably at some time between ten o'clock and three, the swarm will issue. Out from the entrance of the hive they pour, living drops in a great flood of life. The air is quickly filled with wings and the sound of them. There they circle and swing and weave strange patterns in the sunlight. Then the watching beekeeper notices a shifting of the nebulous cloud, and presently is aware of a quiet dark ball forming on the branch of a tree. Soon they are all clustered there, hanging in almost ominous silence after the rapture of the moment before. Probably more than half the occupants of the hive are there, perhaps two-thirds of them, bees of various ages. And somewhere in their midst is their queen. Did she lead out the swarm or follow? Who knows? Probably the latter.

Anyway, there they are. And there they hang, perhaps for 15 minutes, perhaps for several hours, or even longer. The theory that scouts are going about hunting for the new home seems to be rather generally accepted, tho one sometimes wonders why they failed to do that necessary bit of reconnoitering earlier. At any rate eventually (and sometimes now) the dark cluster stirs and breaks, and again the air is filled with wings. But this time, instead of gayly whirling and circling, they start straight off towards the spot chosen for the new abode, a hollow tree or a cozy corner hidden under somebody's eaves. There they start housekeeping. The young bees hang in their strange rapture of silence and produce the wax to build new comb, the queen is soon laying in the fresh cells, field bees bring in nectar and pollen, and the whole cycle is started anew.

If the beekeeper be present when the swarm issues, he will take matters into his own hands and the bees will find themselves possessed of a hive instead of a hollow tree. When they are shaken or dumped into the new hive, wings start a glad fanning, little bodies are raised at a queer angle that somehow signals the others to come on, and soon they are all marching in.

After a swarm has left, a busy quiet settles on the old hive, known to the beekeeper as the "parent hive"—altho the real parent of the hive, the queen, has accompanied the swarm. Yet viewing the colony rather than the individual bee as the unit, it is true that the old hive is the parent. There the lessened numbers continue with their routine duties, undisturbed and apparently untempted by the exciting, adventurous departure of the others. There is now no queen. Yet order and perfect co-operation continue. For in the long rough cells the young princesses are attaining their final growth and development. And presently comes a day when the first one cuts out the end of her cell and emerges, her young slim restless body endued with powers and qualities so different from those of the thousands around her. One of the first acts of her life will be the destruction of the other queens, still in their cells. As only one queen is ordinarily permitted in a hive, there is this deadly rivalry between them; when two queens meet, the stings that are apparently never used elsewhere are brought into immediate use. So when this first fortunate princess emerges from her cell, she leads—thus at least it seems to the human observer—the attack on the helpless rivals unfortunate enough to be a few hours later developing. Soon every one will have been killed, and the workers will have torn down the cells and dragged out the remains.

Sometimes, however, they do not permit this destruction. For if after-swarms are desired (they never are, by the intelligent beekeeper, but sometimes seem to be by the bees), then the other cells are carefully guarded from the attack of this first queen, and in a few days she herself is going off with a swarm, leaving the other cells to provide a queen for the remaining bees. These may send out still another swarm, and even several others, tho this is both unusual and disastrous.

When no after-swarms are planned, the remaining cells are destroyed. Then the first-issued queen lives about a week of carefree youth, while gaining the strength needed for her flight. Several times on different days she will venture into the air around the entrance, just as the young worker bees do, marking well the appearance and location of her home. Then on some bright day she will strike bravely out, straight up into the high places, for her nuptial flight. And when she returns, life will quietly settle into a matter of duty and routine.

By this time the bees are devoting themselves feverishly to an enthusiastic gathering of nectar. And when the main honey flow comes on (which may have happened before the swarm went out), the instinct that prompts them to store what they do not immediately need fills comb after comb with the nectar which is then evaporated and ripened into honey, and sealed.

All this activity, including of course the gathering of pollen too, continues thruout the summer, whenever there is anything at all in the fields. Some time in late summer when the nectar flow fails, or later, when the days shorten and the nights grow cool and long, comes the destruction of the drones. And soon autumn has come. Then it, too, goes an unreturning way, and winter lies over the beeyard.

It is in the winter that they form the cluster. For bees are not warm-blooded creatures; their body temperature rises and falls with the temperature of the air about them. By muscular exercise they can produce heat. But were they to get as cold as 45 degrees F., they would lose all power of motion, and death would doubtless soon ensue. So when the air in their hive gets as cold as 57 degrees, they take matters into

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FROM NORTH, EAST, WEST AND SOUTH

In Northern California. The 32nd annual meeting of the California State Beekeepers' Association was truly a pretentious affair. April "Gleanings" acquainted you with the fact that the Governor of the State designated March 1 to 7 as California Honey Week. This proclamation proved universally beneficial, for it stimulated the consumption of honey to a very considerable extent. The attendance at the meeting was unusually good, and some of the sessions were attended by 400 to 500 persons. The credit for the success and the great enthusiasm displayed at the convention was due entirely to the efforts of the Alameda County Beekeepers' Association, and the president and secretary of this organization were duly rewarded by being elected to similar positions in the State Association. We look for big things at the next annual meeting. It was regretted, tho, that none of the Washington officials were present to advise us on some of the more knotty problems of beekeeping. Their presence was unquestionably missed, for at one of the sessions a petition was circulated, requesting a continuance of the winter short courses in beekeeping held jointly by the U. S. Department of Agriculture and the University of California Agricultural Department. Having a seat where I could view the beekeepers at this session, I noticed that every beekeeper present signed the petition. Prof. W. B. Hermes, head of the Division of Entomology of the University of California, gave us an outline of what he proposes to accomplish for the beekeepers of the State. His talk impressed us favorably, and we have reason to believe that California beekeepers are going to receive what they have long been waiting for, namely, aid in apiculture—aid worthy of the fair name of our university and of our State.

Low prices for honey and the continued high cost of production are the chief concerns of beekeepers today. It is presumed by most of us, according to present indications, that alfalfa honey will bring about 6 to 7c, and sage about 10 to 12c a pound—about half the value that our product brought us one year ago. On the other hand, when we analyze our expenses we find that aur auto expenses have suffered practically no reduction, and that our labor and container accounts have undergone but a reduction of 10 per cent over last year's figures, and our other operating expense accounts remain materially the same. Beekeepers' supplies, our chief capital expenditure, are but little cheaper than they were a year ago. It seems that our best bet lies in creating more of a demand for honey. There is no other one thing we can do that will increase more the value of our product, unless it be a higher tariff, than to popularize broadcast the good values of honey as a food. The United States is now a very wealthy nation, and many countries today, including some of the European ones, are sending us honey. Obviously this fact makes it all the more difficult for us to dispose of our product. The New Zealand Co-operative Honey Producers' Association, Ltd., seems to be more optimistic than we are in regard to honey prices. It is the understanding that this association will advance to its members for white and light-amber grades 12c per pound. Our Exchange, I believe, will not make an advance of over 6c per pound. We hope our New Zealand friends are correct in their interpretations of marketing conditions, but we are inclined to believe that our Exchange will place itself in a much more satisfactory position if it places its advance in the neighborhood of 6c. M. C. Richter.

Big Sur, Calif.

* * *

In Southern California. Since my last report some European foul brood has appeared. At no time since the first outbreak has it been found in so virulent a form as in a few places recently. Whole frames of brood will die within a few days. There appears to be no accounting for its return. The amount of stores seems to make no difference, as many afflicted colonies have an abundance of honey. Italian bees are supposed to be immune from this disease, but not so in the present epidemic. It is found among the colonies which had an abundance of early pollen, as well as among colonies that were located away from the early pollen and were late to start breeding. One thing is certain—it is here and the beekeepers have a fight on their hands again to eradicate it. Some cases of American foul brood are also found, but this has not gotten such a hold as the European.

The prospects for a crop over southern California are no brighter. The oranges are blooming, and the strong colonies are getting a little more than a living. The sages promise little or no honey; for the plants, in general, are suffering for moisture enough to give them a normal growth. The prospects for more rain are not at all encouraging, as the average rainfall after this date is very small. The alfalfa should furnish the usual amount, and the mesquite about the same. Beans, which have furnished considerable honey the past few years, have dropped in price so much that the acreage is likely to be very much reduced this year.

More bees have been moved to the oranges this season than ever before, one company alone having about 2,000 colonies. Generally speaking, the bees will hardly be up to normal for the early honey flow.

FROM NORTH, EAST, WEST AND SOUTH

Taken all in all, it is not likely that southern California will produce as large a crop as last season.

The prices of honey are likely to be much lower than last year, as there is considerable honey being carried over from last year's crop. The price of supplies has not dropped to any noticeable degree, and wages are now about the same as during the war.

Several prosecutions have occurred recently for moving or selling bees contrary to the State laws or the county ordinances. When operating as many as one or two thousand colonies, it is very difficult at all times to comply with all the requirements of the complicated rules and regulations. It is unfortunate that we cannot have a State law governing the moving of bees. Many beekeepers have only a few colonies, and yet they are the ones who have the most to say when it comes to law-making. Some larger apiaries are being kept; and, while the number of beekeepers may not be so great, the production of honey is greater, owing to the skill, knowledge, and general intelligence used in conducting the business. It is my opinion that producers will eventually get together and have laws enacted that will not only protect the industry but will also give a certain freedom of action in running the business.

Corona, Calif. L. L. Andrews.

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In Texas. The condition of the honey plants and bees in March has been above normal. The dry weather during the winter made it doubtful whether there would be an early spring flow, but the rains of the early part of this month have made bloom enough to allow the bees to produce brood early. In some of the southern counties swarming was common by the 10th. Where Demuth automatic feeders were used (see page 216, April issue), many hives now have two brood-chambers and a shallow super of brood; while where bees went into winter short of stores, such colonies have not even commenced to prepare for swarming. The horsemint, which was despaired of because of the drought, is now in a prosperous condition. The mesquite, which was thought to be good for a flow, is not in so good a condition owing to the rain. The Weather Bureau reports that the temperature for March was seven degrees above normal. The coldest day of winter occurred in November, 1920, when a temperature of 27 degrees was reached. Only during four periods did frost occur. This weather was such as to cause the bees to use enormous amounts of stores.

B. M. Caraway of Wyoming has started a new line of migratory beekeeping. He was unable to contract for queens at a price that suited him, so he picked up his suitcase and came to Texas. He expects to raise between 1,500 and 2,000 queens to take back with him and to get back to the home place in time to catch the first honey flow.

Dr. Morris Fishbein, M. D., editor of the Journal for the American Medical Association, writes that honey has received its share of space in recent medical literature. Two long papers on the value of honey in medicine have been published in the past two years. They are entitled, "The Antiscorbutic Value of Honey," by H. K. Faber, published in the Journal of Biologic Chemistry; and "The Curative Properties of Nectar, Corn Pollen, and Honey in Avian Polyneuritis," by R. A. Dutcher and L. O. France, published in the same journal. He also states that honey needs no recommendation to the medical fraternity.

E. B. Ault reports the first extracting of new honey on March 7 when he obtained several thousand pounds of como and pink sage. This honey is from apiaries located in the Rio Grande Valley. He also reports the flow from huajilla in Duval County commenced March 10.

The response of the plants of the semiarid lands to rainfall is extremely rapid and in a majority of cases certain. Last month it was stated that an early honey flow from mesquite was almost certain; and, in fact, in a few localities it did commence. The latter part of March a heavy rain fell, and, true to the habit of the desert plants, the mesquite buds ceased to open and the trees put out new branches and leaves. This habit of these plants comes from the fact that they must utilize moisture while it is available. Should dry weather occur in May or June, the food and energy will appear then in a heavy bloom. H. B. Parks.

San Antonio, Tex.

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In Ontario.—In last month's Gleanings I drew attention to the fact that reports had been received stating that the consumption of stores in outside-wintered colonies had been abnormally heavy. Since then we have had an opportunity to give a superficial examination to probably over half of our bees, and we find every colony heavy with stores. Outdoor-wintered bees have fared the best this year, and many beekeepers report 100 per cent of the colonies alive and most of them in good condition. The season is about the earliest on record, and, barring a setback of cold weather in the near future, it looks as tho fruit bloom, dandelion, etc., will be on at least two weeks earlier than usual. Personally, I would prefer a season more nearly normal, but we must take things as they come and work accordingly. Many are predicting heavy freezes later; but, with the ice all out of Georgian Bay, Lake Simcoe, and other waters to the north of us,

FROM NORTH, EAST, WEST AND SOUTH

one factor is removed that has a tendency to bring on late cold spells.

Reports on clover are quite varied. Yesterday I met Mr. Sibbald, who operates a lot of bees in Peel County just west of York County, where we live. He reports alsike as looking well, while here in our district all fields are damaged, and at least 50 per cent of the acreage ruined. A trip up the Midland line this week revealed the fact that the damage is very heavy to clover all the way from our place to Coldwater—some 75 miles. Around Beaverton where land is flat and the soil is a heavy clay, an extensive farmer told me that hardly an acre is left. Indeed the fields along the railway plainly showed the great damage done. I have no idea how general this condition is, but, so far as we are concerned, clover offers the poorest prospects for some years. Some have said that sweet clover will not ''heave'' out in the spring, but the contrary is nearer the truth. A mile north of us there is a field of sweet clover that was a mat of rank growth last fall. A few days ago no evidence of life could be seen from the road, so I stopped to see what was wrong. Practically every plant was heaved right up out of the ground and lying dead among the stubble. Many of the roots were 10 inches long, but the freezing by night and thawing by daytime had lifted them out, root and branch. This field is rather low and the soil is of a nature that causes clover to heave more readily than on higher land, so I am hoping that fields more favorably situated may be all right.

Alsike clover stands the spring test better than sweet clover or red clover, owing to the different nature of its roots; but, this year much of the alsike is ruined.

There is considerable interest here in Ontario in the Honey Producers' League and its development will be watched with interest. With falling prices in sight, and reports of good wintering general, producers on a commercial scale are beginning to wonder just what we may expect should we have a bumper crop. Sugar is firmer than earlier in the season, with prospects at least of being no cheaper for some time, if wholesalers have the right ''dope'' on the matter. Fairly dear sugar may have a stabilizing effect on honey prices to a certain extent—just how far is a debatable question. For the past five years it has not been a question of selling, but rather of producing. Who knows but that these conditions may be reversed for the next five years? Here in Ontario we have practically no organization at all, and, in my opinion, we never will until slow and low markets force us to do something. Personally, I am not strong on many phases of this organization question, but one of our greatest needs is for a more equitable distribution of our product. In years of varied crops, that is, with heavy yields in some parts of the province and little honey in another part, I have known honey to go almost begging for a sale; while, less than 200 miles away, consumers could not get what they desired even at a much higher price than honey was bringing where the crop was good.

Markham, Ont. J. L. Byer.

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In North Carolina.—Bruce Anderson of Terra Ceia, Beaufort County, chosen president at the January meeting in Wilmington, has an aggressive program of activities for the North Carolina Beekeepers' Association for the current year, including particularly an exchange for the benefit of the membership. This has for its purpose the listing with the secretary, by members, of honey and bees they have for sale. Any members wishing to buy honey for their local trade, or bees to increase their apiaries, can also register with the secretary, so that those having surplus and those wanting to sell can be put in communication with each other. It is believed that a very great benefit will result.

There is a strong sentiment among the association membership for a state-wide campaign for impressing upon the housekeepers the great and practically indispensable value of honey as a food, one that should be on every dining table every day of the year. If this is worked out as is being recommended, the State Association will arrange for special articles and advertisements in the State press, and the local beekeepers will follow up with advertisements of their special products in their local papers.

The 1921 spring season has opened up in a remarkably auspicious manner, so far as prime condition of bees and the promise of abundant honey flows are concerned. Beekeepers have been especially busy for weeks seeing that colonies are in condition for maximum growth and that supers are ready for swift installation as the hive requirements develop.

State Bee Specialist C. L. Sams has been making the rounds of the different sections of the State this spring with all possible speed and is scheduled for the southeastern, or Wilmington-Goldsboro section the week of April 5-15. Wherever it is possible to arrange for them there are demonstrations in transferring bees from the gum and box hives to standard hives, and lectures and demonstrations in bee-yards are arranged practically everywhere he goes. In this way the passing of the old gum and box hives is being materially hastened.

Wilmington, N. C. W. J. Martin.

HEADS OF GRAIN FROM DIFFERENT FIELDS

Wiring Frames. Last summer during part of the season I used the "thousand dollor trick" in wiring frames, and then I happened upon the figure-14-method (see page 85, February Gleanings), which pleased me much better. I thought I was the originator of the idea.

I found the best way to tack the brace wire to the top-bar was to hook a double-pointed tack around it and then use a pair of wide-mouth pliers for squeezing it into the bar, one point being slanted into the edge of the foundation. The pliers straddle the top-bar, the lower jaw catching the tack. This is an easy, convenient way, besides avoiding the risk of bruising the foundation by pounding. I. W. Cameron.

Davis, S. D.

* * *

Two Seasonable Hints. By inserting a comb containing mostly drone-cells, or, if no such comb is to be had, an empty frame with starter only (which in a very short time during fruit bloom will be filled with beautiful drone comb with eggs and larvae) in the brood-nest of a colony known by their good qualities, you will stand a good chance of having drones that will improve the stock. If the brood combs in other colonies are all good worker combs, the chances are better still. Then by breeding queens also from the best stock you will be following the way of our dear departed Dr. Miller.

A colony of bees will swarm sooner when there are not enough bees to carry on super work, thus storing more honey around the brood-nest than a strong colony that has most of its brood combs filled with brood, many young bees emerging daily, and workers busy both in the fields and in the supers. If the colony light in bees had been given empty combs in the super instead of foundation, work would have been carried on in the super, relieving the brood combs of surplus honey, thus retarding swarming if not preventing it altogether. The folly of trying to get bees to draw foundation when the colony contains too few bees is very plain to be seen. All such should be given empty combs to store in. A. C. Gilbert.

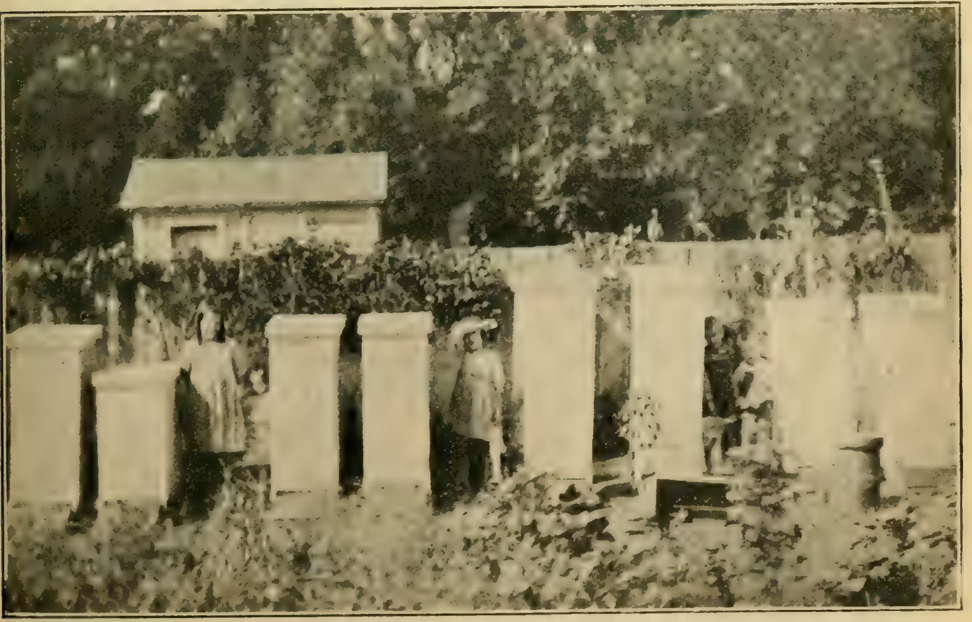
East Avon, N. Y.

* * *

Refused $1000 for 23 Colonies. This is the way my children are afraid of bees. They play around the hives as tho there were no bees there. We did not have a natural swarm this year.

I was offered a check for $1000 for these 23 colonies (just as they stand in the picture) and an old two-frame extractor, but I said, "no." The 23 colonies had 74 supers which were 10-frame standard hive-bodies. Well, when fall came I had 4160 pounds of honey, which we sold for 25 cents per pound, amounting to $1040. Last year the same bunch brought us over $1200.

Scotland, S. D. O. G. Borton.



Part of the 23 colonies which the owner refused to sell for $1000.

HEADS OF GRAIN FROM DIFFERENT FIELDS

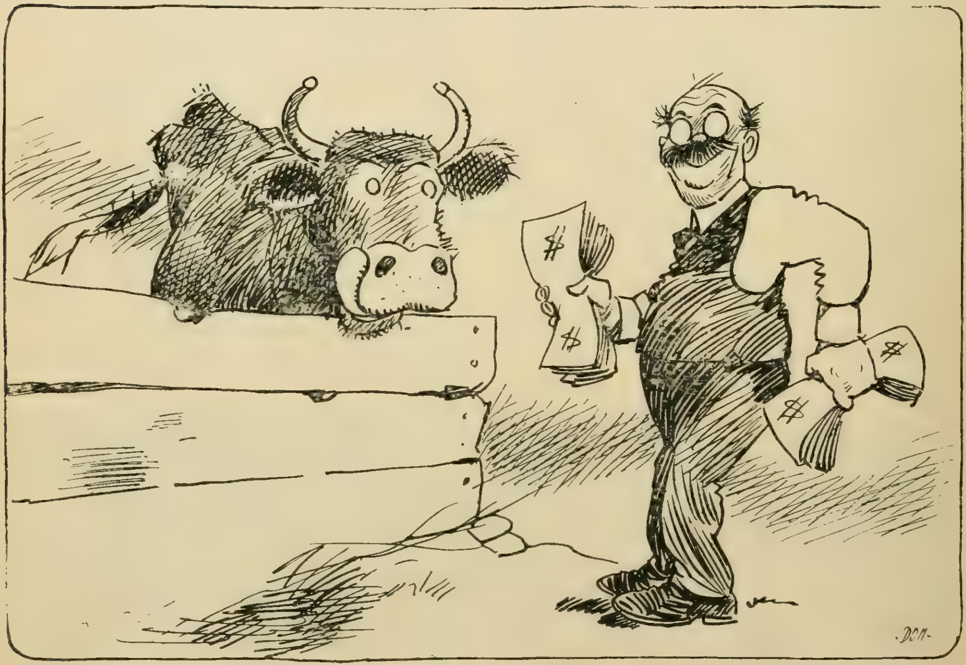
Deep Tunnel Prevents Clogging. I notice on page 101, February Gleanings, that Carl E. Johnson uses a tin tube to prevent clogging of the entrances of his hives; and also, on page 154, that J. E. Crane uses a similar plan. In connection with my quadruple cases, I have a plan which takes care of clogging without any extra apparatus. My tunnel is 1¼ inches deep on inside and made of ¾-inch stuff, and is so adjusted that the bottom of the tunnel drops down to the lower edge of the bottom-board. This gives room for two rows of holes ⅜ inch in diameter. I bore five in the case along the bottom of the tunnel and four near the top.

My cases have 4 inches bottom packing, 8 inches side packing, and 12 inches on top of a two-story hive. With this amount of packing there is not much accumulation of dead bees; and the full entrance to the hive, the deep tunnel, and the double row of ⅜-inch holes seem to take care of this in good shape. H. C. James.

Wooster, O.

My Queens.—By Bill Mellvir

(With apologies to Walt Mason.)



I have some old flea-bitten queens who work the laying graft so strong that, day and night, behind the scenes, they keep a plugging right along. They're shelling out the eggs so fast, that brood extends from roof to floor; and when they've filled all cells at last they fuss around and hunt for more. But if in vain for room they strive, my noble queens create a storm. They spread dissension thru the hive and finally decide to swarm. I fool these old birds nowadays; I fool them to a fare-you-well. I steer them from their erring ways before they get this swarming spell. I never let such tommyrot into their little noodles bob; I help their sanity a lot by giving them another job. Before they're crowded from their homes and spill the everlasting beans, I give another set of combs to satisfy ambitious queens. My queens, thus freed from narrow bounds, upstairs on eager legs will go, where buoyantly they make their rounds and lay a pint of eggs or so. The workers too hit up their gait, if any were inclined to shirk. They feel the urge like any skate who takes an interest in his work. He is indeed a foolish gink who puts off duties such as these. These extra eggs per hive, I think, will add an extra peck of bees. An extra peck of bees in June in each and every seething hive, in my location's quite a boon and makes me glad to be alive. The increase in the bunch of dope these extra pecks put in the mow, when sold, will make a roll, I hope, that's big enough to choke a cow.

WHO'S WHO IN APICULTURE

At the close of the season for the regular meetings of the various state associations we have again corrected our page of "Who's Who in Apiculture," bringing it down to date as of March 10. Beekeepers should keep this page for reference. Great care has been taken to have these data correct, the information having been secured wherever possible directly from a state official or from the college of agriculture.

State or Province	Beekeeping Taught in* Agrl. College	Foul Brood Law?	Net Weight Law?	State Inspector or Deputy.	Secretary State Association.
Alabama	Yes	No	No	None.	M. C. Berry........Hayneville
Alberta		No			
Arizona	Yes	Yes	No	L. Earle Matteson. Benson	Geo. M. Frizzell........Tempe
Arkansas	Yes	No	No	None.	Frank Horsfal......Monticello
British Columbia	No	Yes	Yes	W. J. Sheppard......Nelson	John Brooks ......Vancouver
California	Yes	Yes	Yes	County System.	L. W. Lasell.........Oakland
Colorado	Yes	Yes	No	Wesley Foster, Dep..Boulder	W. P. Collins..........Lamar
Connecticut	Yes	Yes	Yes	Dr. W. E. Britton, New Haven	L. S. C. Burr...S. Manchester
Delaware	No	No	No	Wesley Webb, Acting..Dover	None.
Florida	Yes	Yes	Yes	Wilmon Newell ...Gainesville	K. E. Bragdon..........Cocoa
Georgia	No	Yes	Yes	A. C. Lewis.........Atlanta	Mrs. Madge Merritt.Brunswick
Idaho	No	Yes	Yes	W. H. Wicks..........Boise	P. S. Farrell........Caldwell
Illinois	No	Yes	No	A. L. Kildow.......Putnam	G. M. Withrow..Mechanicsburg
Indiana	Yes	Yes	Yes	F. N. Wallace..Indianapolis	C. O. Yost........Indianapolis
Iowa	Yes	Yes	No	F. B. Paddock........Ames	F. B. Paddock..........Ames
Kansas	Yes	Yes	No	J. H. Merrill.....Manhattan	O. F. Whitney........Topeka
Kentucky	Yes	No	No	None.	H. Garman.........Lexington
Louisiana	No	No	No	None.	E. C. Davis.....Baton Rouge
Maine	No	Yes	Yes	Frank H. Dudley...Augusta	F. L. Mason...Mechanic Falls
Manitoba	Yes	Yes	No	J. H. Kiteley......Winnipeg	J. H. Kiteley.......Winnipeg
Maryland	Yes	Yes	No	E. N. Cory.....College Park	E. N. Cory.....College Park
Massachusetts	No	Yes	Yes	Leland Taylor.......Boston	Mrs. H. N. Thomas..Wollaston
Michigan	Yes	Yes	Yes	B. F. Kindig....E. Lansing	R. H. Kelty.......E. Lansing
Minnesota	Yes	Yes	Yes	C. D. Blaker....Minneapolis	O. L. Wille...........St. Paul
Mississippi	Yes	Yes	No	R. W. Harned..Agri. College	R. P. Dunn.........Greenville
Missouri	Yes	Yes	No	?	Dr. L. Haseman....Columbia
Montana	Yes	Yes	Yes	(Not yet appointed)	R. A. Bray........Big Timber
Nebraska	Yes	No	Yes	None.	O. E. Timm........Bennington
Nevada	No	Yes	Comb	Geo. G. Schweis.......Reno	L. D'A. Prince..........Reno
New Brunswick	No	Yes	No	L. T. Floyd......Fredericton	L. T. Floyd.......Fredericton
New Hampshire	Yes	No	No	None.	H. B. Stevens.........Durham
New Jersey	No	Yes	Yes	E. G. Carr......New Egypt	E. G. Carr.........New Egypt
New Mexico				None.	None.
New York	No	Yes	Yes	G. G. Atwood...Albany, N. Y.	J. H. Cunningham...Syracuse
North Carolina	Yes	Yes	No	None.	W. J. Martin......Wilmington
North Dakota	No	No		None.	None.
Nova Scotia	No	Yes	No	W. H. Brittain.......Truro	None.
Ohio	Yes	Yes	Yes	E. C. Cotton......Columbus	Jas. S. Hine, O. S. U., Columbus
Oklahoma	Yes	Yes	No	R. L. Blackwell...Oklahoma	Mr. Howard..........Wewoka
Ontario	Yes	Yes	Yes	F. Eric Millen......Guelph	F. Eric Millen.........Guelph
Oregon	Yes	Yes	Yes	County System.	H. A. Scullen.......Corvallis
Pennsylvania	Yes	Yes	Yes	J. D. Sanders...Harrisburg	Chas. N. Greene.........Troy
Prince Edw'd Isl.	Yes	Yes	No	H. Newson.....Charlottetown	None.
Quebec	Yes	Yes	No	C. Vaillancourt .....Quebec	J. A. Prud'homme, Ste. Philom.
Rhode Island	No	Yes	Yes	A. E. Stene.......Kingston	E. D. Anthony.....Barrington
South Carolina	Yes	No	No	A. F. Conradi.............	None.
South Dakota	Yes	Yes	Yes	L. A. Syverud......Yankton Ernest W. Fox....Fruitdale	J. C. Tjaden..... .Vermilion
Tennessee	Yes	Yes	Yes	J. M. Buchanan....Franklin	G. M. Bentley.......Knoxville
Texas	Yes	Yes	Yes	C. S. Rude....College Station	Miss A. Hasselbauer, S. Antonio
Utah	Yes	Yes	Yes	F. B. Terriberry, Salt Lake C.	F. B. Terriberry, Salt Lake City
Vermont	No	Yes	Yes	E. G. Brigham...Montpelier	E. W. Larrabee.....Shoreham
Virginia	No	No		None.	W. J. Schoene.....Blacksburg
Washington	Yes	Yes	Yes	Dr. A. L. Melander..Pullman	E. E. Starkey........Prosser
West Virginia	Yes	Yes	Yes	M. K. Malcolm...Charleston	Will C. Griffith....Elm Grove
Wisconsin	Yes	Yes	Yes	S. B. Fracker......Madison	H. F. Wilson........Madison
Wyoming	No	No	Yes	None.	None.

United States, Investigation and Demonstration in Beekeeping, E. F. Phillips, Apiculturist, Bureau of Entomology, Washington, D. C.

National Honey Producer's League, H. J. Parks, secretary, P. O. box 838, San Antonio, Texas.

Dominion of Canada, Investigation in Bee Culture, F. W. L. Sladen, Dominion Apiarist; Central Experimental Farm, Ottawa, Can.

*Beekeeping taught also in some other colleges and schools in Arkansas, California, Louisiana, Massachusetts, Minnesota, North Carolina, Ohio, Prince Edward Island, Quebec, Tennessee and Texas.

GLEANED BY ASKING

Editors

Question.—Being away from the apiary at the time the swarm issues, how can I tell accurately which colony the swarm came from?
J. T. Wilson
Kentucky.

Answer.—You may be able to tell by noting the bees at the entrances of the hives. A colony which has just cast a swarm usually has but few bees going to and from the hive and not so many bees around the entrance. If you can not tell this way, you should be able to find the colony that has just swarmed by looking into the supers, for they are usually somewhat deserted after the swarm issues. When you find the colony which you think has swarmed, open the the hive and look for queen-cells. Sealed queen-cells, together with a greatly reduced number of workers, are usually sufficient evidence that the colony has swarmed.

PRODUCING COMB HONEY ON TWO-STORY HIVES.

Question.—Should I put the comb-honey super on top of my two-story hive or should I take off the upper story first? Arthur Newcomer.
Pennsylvania.

Answer.—It will be much better to reduce the hive to a single story before giving the comb-honey supers, since if this is not done the bees do not begin work in the comb-honey supers promptly; and, unless the honey flow is good, they may refuse to work in them at all, but crowd the honey into the two brood-chambers. When reducing the hive to a single story, the combs should be sorted, and most of the brood put into the brood-chamber that is left. The other hive-body, which contains some brood and honey, should be placed on top of some weaker colony not used for comb-honey production, first shaking most of the bees from the combs, shaking them back into their own hive.

PREVENTION OF INCREASE.

Question.—Could I double up swarms, new and old, to prevent increase? Would cutting out queen-cells stop swarming, or does this endanger the colony's becoming queenless? A. O. Stindt.
Minnesota.

Answer.—Yes. Hive the swarm in a new hive on the old stand, as described in "Talks to Beginners" in this issue; then, instead of moving the hive to a new location a week later as there described, set it on the other side of the swarm, turning its entrance away from that of the swarm at first, to prevent the returning bees of the parent colony from finding their hive after it has been moved, thus compelling them to unite with the swarm. Later, turn the entrance of the parent hive toward that of the swarm so the two hives stand side by side. At the close of the honey flow, take off the supers, spread a sheet of newspaper over the brood-chamber of the new hive, punch a few pin holes thru the newspaper, then set the old brood-chamber (without bottom) on top of the new hive. By killing the old queen before this is done, you will decide which queen is to remain instead of letting the bees decide this. This plan should result in splendid colonies for winter.

COMB-HONEY SUPERS AND FOUL BROOD.

Question.—Please tell how to get rid of foul brood in comb-honey supers without destroying the sections and full sheets of foundation in them. Is there any way of fumigating? Paul B. Gilbert.
Ohio.

Answer.—You do not tell whether you refer to American foul brood or to European foul brood. If European foul brood, no treatment is necessary, these supers probably being as safe to use again as tho they had not been used before. If you refer to American foul brood, there is no practical way known to kill the spores of this disease by fumigation. If the comb-honey supers do not contain any honey, the danger of transmitting American foul brood by using them again is probably not very great, if they are scraped clean and have not been daubed with honey from the diseased colony; but, if combs have been built and honey stored in some of the sections, it will not be safe to use these.

SHALLOW EXTRACTING SUPER ABOVE SECTIONS.

Question.—How will it work in comb-honey production to use a shallow extracting super over the brood-chamber; then when the time comes to put on sections, set the shallow extracting super over the sections, with a queen-excluder between the shallow super and the sections; and when all the brood has emerged in the shallow super, move it back on top of the brood-chamber?
North Carolina. Douglass Laughlin.

Answer.—This should work well, so far as a prompt beginning of work in the sections is concerned, especially if the shallow extracting super is well filled with honey and brood at the time the comb-honey super is given; but, if left on long, the bees will use some of the dark wax from the brood combs in the shallow super in building comb in the sections. They also soil the sections badly within a short time when brood is placed above them. For this reason it is better to take off these extracting supers, either at the time the comb-honey supers are given or a few days later, and tier them up on top of some weaker colonies not being used for comb honey. They can then be given back to the colonies after the comb-honey supers are removed. When one of these shallow extracting supers filled with sealed honey of good quality is given to each colony at the close of the season, good colonies for winter are practically insured in all colonies that are normal and have a good queen.

QUEEN TRAPS FOR SWARM CONTROL.

Question.—If I use a queen trap, then kill the old queen when a swarm issues, letting the bees go back into the old hive, would they stay or would they come out again? C. E. Laflin.

Illinois.

Answer.—They would stay until after the first young queen emerges, when they would again attempt to swarm, this usually being about eight days after the first swarm issued. If you destroy all but one of the queen-cells about seven days after the first swarm issued, there usually is no further attempt to swarm; but occasionally even when this is done, the colony may swarm, tho this does not often happen. If the queen trap is left on and swarms are permitted to issue when the young queens begin to emerge, the trap will catch the young queen each time and the swarm will return unless it should unite with another swarm having a queen which happened to be out at the same time; but the colony may attempt to swarm day after day until there is but one young queen left within the hive. At this time the queen trap should be removed to permit the remaining young queen to mate. This method for swarm control is not to be recommended, for while the bees are attempting to swarm every day they usually do very little work.

LEAVING UNSEALED BROOD WITH ARTIFICIALLY MADE SWARMS.

Question.—If I leave the old queen with four frames containing the most larvae and eggs on the old stand, first shaking these four combs nearly clean of bees, then move the old hive to a new stand, would the colony on the old stand swarm if cells are left or would the half-empty hive discourage them? In the parent colony which was moved away would the first young queen out destroy the rest of the queen-cells? Leon Stafford.

New York.

Answer.—If queen-cells have already been started in the four combs of brood left in the hive on the old stand, the bees, in most cases, will finish them and swarm on schedule time, in spite of the empty space in the brood-chamber. Even if all of the queen-cells are destroyed on these four combs, the bees may immediately start other cells and swarm later when as many as four combs of brood are left, if the tendency to swarm is strong. If no queen-cells are left and these four combs are taken away three or four days after the colony is treated as you describe, the colony should not swarm during ordinary seasons. In this event the brood-chamber should be filled out with either empty combs or frames of foundation at the time of treatment, and when the remaining four combs of brood are removed later the space thus made vacant should again be filled. For comb honey, frames containing full sheets of foundation are preferable for this, but for extracted honey either frames of foundation or empty combs may be used.

The parent colony which was moved away is, of course, depleted by its field bees returning to the old stand, and, if the young queens are ready to emerge at the time the hive is moved away, this colony will usually give up swarming and permit the first young queen that emerges to destroy the other queen-cells; but if the first young queen does not emerge until several days after the hive was moved away, so many young bees will have emerged that the colony is almost sure to swarm.

PUTTING PACKAGE BEES INTO HIVES.

Question. — When my two-pound packages of bees arrive, how shall I proceed to put them into the hives? Shall I give them drawn combs or foundation? Theodore C. Goetz.

Connecticut.

Answer.—Before the bees arrive the hives should be prepared to receive them, each located where it is to stand permanently, and each one supplied with as many drawn combs as there are pounds of bees in each of the packages. If drawn combs can not be had, full sheets of foundation may be used.

When the bees arrive they should be kept in a cool place until late in the afternoon. If they were shipped in the new-style cages, which have a frame containing foundation and the feeders, set them close beside the hive and blow a little smoke over the wire-cloth top to drive the bees down. Now remove the cover carefully. Take out the stays that hold the brood-frame in place. Then lift the frame out and place it with the feeder in the hive next to one side, and shove the other frames up to it. Be sure that the queen is on this frame with the bees. What bees are on the sides of the shipping-cage should be shaken out on the ground close in front of the hive. They will join the other bees in a few minutes, and what few take wing when the shipping-cage is first opened will go in with them. Two or three days later the feeder should be taken out of the frame. If the bees are shipped in the old-style cages, they should be fed a thin syrup thru the wire cloth as soon as they arrive. To make this, mix sugar and water, two parts of sugar to one of water, and stir it till dissolved. Moisten a sponge or a piece of cotton with the syrup and paint the surface of the wire cloth with the syrup. Keep feeding in this way as long as the bees will take it. To put them into the hives shove the frames to one side of the hive and place the package of bees beside the frames. Then pry off the lid from the package. The bees will leave the cage and take possession of the frames in a short time. This should be done toward night, not during the middle hours of the day, as they might swarm out. As a further precaution, a piece of perforated zinc should be put over the entrance for a few days. A brood-frame filled with honey given to them when they are first made up is the best feed that they can have. If you do not have this they should be given about a teacupful of syrup daily until there is the equivalent of one full frame stored ahead.

JUST NEWS

Editors

Pennsylvania has just enacted a new foul brood law, which makes it unlawful to ship bees, hives, or appliances into the State unless accompanied by a certificate of inspection signed by a certificate of the state or county from which they are shipped.

* * *

The United States Civil Service Commission announces an open competitive examinaion for apicultural assistant, applications to be rated as received until June 30, 1921.

* * *

A swarm of bees is reported to have issued from a two-story hive having brood in both stories at Elwood, Ind., on March 15. This report has been verified by J. H. Rigor of that city. On March 25 a colony of bees belonging to Geo. W. Fetzer, Allentown, Pa., cast a swarm, the brood-chamber being almost completely filled with brood.

* * *

The Oregon State Beekeepers' Association, which first met last fall in Salem, Ore., and effected temporary organization, met on March 16 and 17 in Portland, Ore., and became a live permanent organization. Owners of more than 4,000 colonies were present, and yet none of the really large producers were there to report. Over 150 joined the association, and many live topics were discussed. County organizations are being organized, Linn-Benton, Clackamas, and Multomah counties already having perfected county organizations, which are to become a part of the state organization. H. A. Scullen, Corvallis, Ore., is the enterprising secretary of the State association.

* * *

The heaviest damage to fruit from freezing occurred in the south central sections of the country from the lower Great Plains eastward. The damage was probably not very great in the northern border States except the injury to cherries and peaches in New York and to apples in Ohio. Much fruit was killed as far south as parts of North Carolina, northern Georgia, and northern Alabama. Additional injury is reported from Colorado, Utah, and portions of New Mexico and Arizona. Considerable damage is reported from California and Oregon. There was some damage to alfalfa and clover in the Northwestern and the Central States.

* * *

The Mississippi and Yazoo Delta Beekeepers' Association has recently completed their organization and adopted plans to push the sale of honey by organized effort and putting up honey in attractive packages. The organization is planned to furnish a system whereby the beekeepers can co-operate in educational work, marketing honey and apiary products, and the purchasing of supplies. R. P. Dunn, Greenville, Miss., is secretary treasurer of this association.

* * *

The Cook County Beekeepers' Association was organized at a meeting of 150 local bee keepers on March 21, at the Great Northern Hotel, Chicago. It is expected that monthly meetings of an inspirational and educational character may be held during the winter and spring, with field meetings for demonstration at members' apiaries during the summer months. The purpose is stated to be that of making better beekeepers of all its members and of protecting the industry in this section against the menace of disease. A. C. Gill, 230 West Huron St., was elected secretary-treasurer.

* * *

The tree planting committee selected by the American Honey Producers' League is planning to co-operate with the state highway commissions of the various states in regard to planting nectar-bearing trees along state highways. It also plans to work thru the various rural planting committees, national and state foresters, conservation commissions, lumber and forestry associations, state horticultural societies, and other agencies and individuals interested. It is the plan of this committee that each state association shall appoint a state tree planting committee and that these state committees shall arrange for a tree planting committee in each county.

* * *

Advance census figures, received to date, show the number of beekepers and colonies of bees as follows:

	Beekeepers		Colonies	
	1910	1920	1910	1920
Alabama ...	23,911	25,266	135,140	153,766
Delaware ..	1,119	446	6,410	2,976
Dist. of Col.	13	4	151	19
Idaho	2,368	3,416	21,903	35,900
Maine	1,371	2,009	7,592	12,639
Maryland ...	4,186	2,720	23,156	16,117
Ohio	23,203	17,250	98,242	105,675
Rhode Island	285	168	1,267	686
Tennessee ..	27,706	30,961	144,481	191,898
Utah	1,873	1,453	26,185	25,061
Vermont ...	1,124	1,038	10,215	10,024
Washington .	5,886	8,068	33,884	56,806
W. Virginia.	24,035	18,620	110,673	89,873
	117,080	111,419	619,299	701,440

It will be noted that the number of persons reported as keeping bees in 1920 is less than the number reported in 1910, but the number of colonies is greater. These figures are for bees on farms only, the holdings of those living in cities and villages not being included.

TALKS TO BEGINNERS

By the Editor

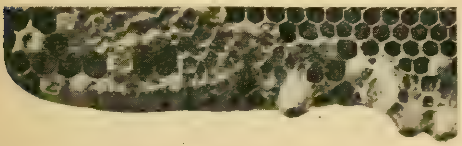
In the spring when conditions are favorable for brood-rearing, the bees will increase the amount of their brood with surprising rapidity until they may have as many as 10 to 15 combs fairly well filled with brood. Such extensive brood-rearing does not last long, and many colonies do not reach more than seven or eight combs of brood, even at the height of spring brood-rearing. As this brood emerges the colonies soon become so strong that,if extra room is not given, the bees may not all be able to stay within the hive during warm nights, but may cluster in large masses on the outside.

This is the time that the instinct to swarm is aroused in the colony, and the period of most extensive brood-rearing in the spring is usually followed by swarming. Beekeepers speak of this as the swarming season. While colonies may swarm later in the season if similar conditions are present, most of the swarming of the season occurs as a climax to the great expansion of brood-rearing in the spring.

How Bees Prepare for Swarming.

The rearing of drones is probably a remote and indefinite step in the preparation for swarming; but, so far as the beekeeper is able to see, the first definite preparation the colony makes is that of starting queen-cells.

In some of the southern States, queen-cells built preparatory to swarming may be found in some of the strongest colonies as early as March and April, but in the North they usually are not built until May or June.



Queen-cells being built.

Queen-cells are usually built along the lower edge of the comb and are so constructed that the opening of the cells is downward, thus making these cells nearly vertical instead of nearly horizontal, as are the worker-cells. Frequently partially built queen-cells or "cell cups," which are empty, may be found along the lower edge of the combs. These are sometimes built long before eggs are placed in them in preparation for swarming, and are therefore not necessarily significant as indicating a desire to swarm. Finally several of these cell cups are built and eggs are laid in them. This means that the colony is now definitely preparing to swarm unless the queen is old and failing, in which case it may mean that the bees are rearing another queen to take her place. With normal colonies having a normal queen, the starting of queen-cells means that a swarm may be expected to issue eight or nine days from the time the eggs were laid in the queen-cells.

The beginner can follow the entire program, as carried out by the bees, by watching the development of these queen-cells. Usually the swarm issues at about the time the more advanced of these queen-cells are capped, tho Italian bees sometimes swarm earlier, and bad weather may compel the bees to wait until later.

Prime Swarms and After-Swarms.

When the swarm issues under these conditions the old queen goes along, leaving behind the immature, young queens in their cells. Enough bees stay in the old hive to take care of the brood, which at this time is emerging so rapidly that the parent colony soon has quite a force of bees again. If the prime swarm issued on schedule time (when the first queen-cells were capped), an after-swarm may be expected from the parent colony about eight days later, the after-swarm being accompanied by one of the recently emerged young queens. If the beekeeper does not interfere to prevent it, usually several after-swarms issue, one coming out every day or two, until the colony is so depleted that there are no longer bees enough to divide up among the remaining young queens. Usually but one of these young queens is at large in the hive at a time, the others being held prisoners within their cells, tho sometimes two or more young queens may go out with an after-swarm. Finally, when no more swarms can be sent out, all but one of the young queens are killed, the surviving one being destined to become the new mother of the colony.

Swarming Undesirable.

If the bees are permitted to carry out their own program completely as to swarming, it usually means a loss of the honey crop from the colonies that swarm, since the great army of workers which filled the hive to overflowing at the beginning of the honey flow is dissipated by swarming. The bees should not be permitted to divide their working force just before or during the honey flow, and the beginner must learn to prevent this.

Clipping the Queen's Wings.

Preparatory to taking care of any swarms that may issue, it is advisable for the beginner to find the queen in each hive and clip off the greater portion of the wings on one side. This is to prevent the queen from flying when a swarm issues, thus giving the beekeeper control of the swarm if it should choose to cluster in the top of a high tree or fly away to the woods. The same control may be had by using a queen and drone trap, with the advantage that the trap automatically catches the queen; while, with a clipped queen, it is necessary to find her on the ground in front of the hive when a swarm issues. The ambitious beginner should learn to clip his queens, however, and, in the northern States especially, now is a good time to do this. For detailed directions for finding and clipping the queens, see Morley Pettit's article in this issue.

Queen laying and her attendants.

To Prevent Swarming When Producing Extracted Honey.

If extracted honey is being produced, the first super should be put on some time before the beginning of the main honey flow. In fact, if empty combs are available a super of empty combs should be given as soon as the brood-chamber is fairly well filled with brood, honey, and pollen. The queen-excluder should not be used between the brood-chamber and the super at this time, but the queen should be permitted free range thru both stories. This should prevent early swarming.

If empty combs are not available for this first super, frames filled with full sheets of foundation should be used, but these should not be given until the bees commence gathering enough nectar to cause them to begin to build new white wax on the darker combs in elongating and repairing the cells. When foundation must be used some of the combs of brood from below should be placed in the middle of the second story. This affords an opportunity to place four frames of foundation adjacent to four combs of brood, two in the upper chamber and two in the lower chamber. As soon as the bees have drawn out the foundation in these four frames so that they now really contain combs with shallow cells, these newly built combs can be moved toward the side of the hive, and other frames, which the bees have not yet worked on, put in their places. These new combs are built out better in the second story, and it is well to have most of this work done there.

As soon as new honey is being stored fast enough so that the second story is nearly filled with brood and honey, another super should be placed on top of the hive, making it three stories high. If empty combs are available, eight of these may be used in this 10-frame super, the combs being spaced farther apart so each comb will hold more honey; but, if foundation is used, the frames should not be spaced so wide until after the combs are built out. When foundation is used in the second super, at least two combs from the first super should be placed in the second super to induce the bees to begin work there promptly.

About a week after the beginning of the main honey flow or after the queen has abandoned the lower story long enough so that the brood there has all been sealed, the queen should be put down into the lower story and confined there by a queen-excluder, which should be placed between the first and the second story. The queen will usually be found in the second story at this time. To find her, lift off the third story if one is on the hive; then, without smoking the bees in the second story more than necessary, lift it off and set it on the inverted hive cover in such a manner that the bottom-bars of the frames do not touch the rim of the cover, to avoid crushing bees. By examining these combs one by one, the queen should be found, picked up by the wings, and placed in the lower brood-chamber.

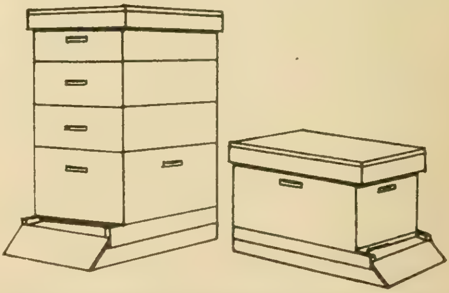


Fig. 1.—New hive with supers on old stand. Old hive turned aside.

In reassembling the hive after the queen has been put down, the queen-excluder should be placed over the lower brood-chamber; the super which was formerly the third story should be put on as the second story; and the former second story, which contains most of the brood, should be put back on top as a third story. If more room is needed at this time, an additional super may be given, in which case the former second story, being placed on top, now becomes the fourth story.

Ten days later it may be well to destroy all the queen-cells that are built in this top super, tho this is not always necessary.

Colonies treated in this way usually do not swarm if additional supers are given as fast as needed, tho they may do so if the honey flow is long.

To Control Swarming When Producing Comb Honey.

When producing comb honey, the first super should be given when the bees begin to add new white wax to the old dark combs in the brood-chamber. The sections in the comb-honey super should contain foundation, preferably full sheets filling the sections almost completely. If possible, the first super should contain at least one section in which the comb is already built, saved over from the previous year. This "bait" comb should induce the bees to begin work in the first super promptly. As soon as the bees commence working on the outside sections of this first super, a second super should be given. If the bees are working well and new honey is being stored thruout the first super, the second super should be placed below the first one; but, if the bees are not working in all sections of the first super, the second super should be placed on top of the first one.

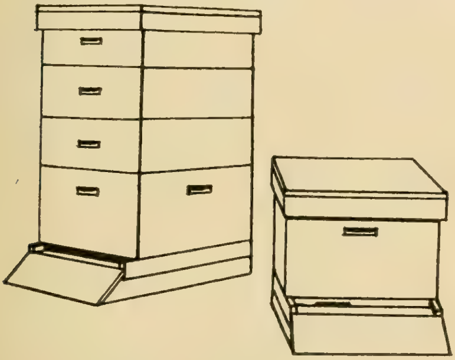


Fig. 2.—Old hive turned back toward new one after swarm has entered.

How to Hive a Swarm.

If a swarm issues look for the queen (if she has been clipped) on the ground in front of the hive while the swarm is coming out. When the queen is found put her into a Miller queen-catcher and introducing cage or any kind of wire-cloth cage in which she can be confined. Lay the cage down near the hive in the shade; then move the hive from its stand, turning the entrance to one side, as in Fig. 1. Place a new hive where the old one stood, having frames filled with full sheets of foundation, and, if available, one empty comb. Transfer the supers from the old hive to the new, put back the covers on both hives, and thrust the cage containing the queen into the entrance of the new hive.

The bees may return and enter the new hive without clustering, or they may cluster and return later. As they are returning none of them should be permitted to enter the old hive. To prevent this, it may be necessary to cover the old hive with a cloth or move it farther away. When most of the bees have entered the hive the queen should be released among them.

If a queen trap is used to catch the queen as the swarm issues, instead of clipping the queen, the procedure is the same except that it is not necessary to look for the queen; but after the swarm is out, the old hive set to one side and the new one is in its place, the queen trap may simply be put on the new hive and the slide pulled out to permit the queen to enter the hive when the swarm returns.

After the swarm has entered the hive and the excitement has subsided, the entrance of the parent hive should be turned toward that of the swarm, as in Fig. 2.

A day or two later the parent hive should be turned with its entrance close to that of the swarm (Fig. 3), and on the seventh day, choosing a time when the bees are working well in the fields and preferably early in the afternoon when many young bees are taking their play flight in front of the parent hive, it should be moved to a new location at least 20 feet away for increase. In moving the parent hive away it should be handled carefully to prevent disturbing the bees, so that the field bees going out will not note the change in the location of the hive. When this is done most of the young bees, which have become field workers during the week, as they return from the fields will now enter the new hive on the old stand where they should be most useful, so depleting the parent colony of its bees that after-swarming is usually prevented; and since most of the workers are held together in the new hive on the old stand the yield of honey should not be reduced on account of the swarm having issued. Usually the parent colony does not produce any surplus honey the same season, but it should be in excellent condition for winter.

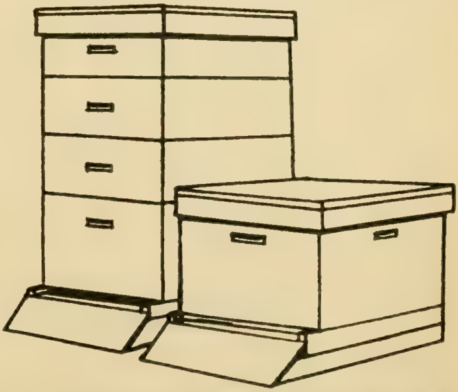


Fig. 3.—Old hive set close to new, ready to be moved away on seventh day.

OUR HOMES

A. I. ROOT

For they sleep not, except they have done mischief; and their sleep is taken away, unless they cause some to fall.—Prov. 4:16.

We have made a covenant with death, and with hell are we at agreement.—Isa. 28:15.

Come unto me, all ye that labor and are heavy laden, and I will give you rest.—Matt. 11:28.

YEARS ago, when the Anti-Saloon League was first started, we had a big convention (I think it was at Columbus), and Lucy Page Gaston was there and wanted a place on the program to talk on cigarettes. But the managers decided—and perhaps wisely—on "one thing at a time," especially when that one thing was such a *stupendous* task. From that time to this, I have felt a good deal that way about dealing with the tobacco matter on these pages. The editor of the *No-Tobacco Journal* (Butler, Ind.) recently said, "We have no hope, at least just at present, of outlawing tobacco from grown-up manhood; but we do hope to get laws, and enforce laws we already have, to keep tobacco, and especially cigarettes, from our immature boys and girls."

I take it you all know about the millions of starving Chinese, and what the good people of America and the rest of the world are doing to save them. From an article in *Good Health* (Battle Creek, Mich.) I clip from the opening, and also a sentence from the closing paragraph:

CONCERNING TOBACCO.

WILL H. BROWN.

Tobacco and Suffering China.

The attitude of American tobacco dealers toward starving, suffering China should bring about the utter annihilation of the tobacco business, were there not another reason in the world for its destruction. The situation is almost unbelievable. American tobacco men have deliberately adopted the slogan, "A cigarette in the mouth of every man, woman, and child in China." Rev. R. R. Blews, writing for the *Free Methodist*, Chicago, says this slogan is posted all over China.

The ghoulish selfishness of the act is seen in the fact that 40,000,000 Chinese are facing starvation, according to Bishop Lewis, who has been traveling over the famine-stricken districts of the country. While the generous-hearted citizens of America are raising money to aid this sorely afflicted people. American tobacco interests are planning to get from them, for tobacco, money so much needed for the bare necessities of existence.

The seriousness of the situation has prompted the Chinese Minister of the Interior to send forth an edict, in which he says that unless restrictions are imposed, tobacco will become a worse curse than opium in former days. That China intends later to totally prohibit the weed is indicated in the following words:

"It is hereby decided that before taking up any measure for the *total prohibition* of its use, the following restrictions shall be placed upon the use of tobacco."

The restrictions mentioned prohibit cigars and cigarettes for any one under 18; for all military or naval men; for students in any Government school or college.

Every real lover of humanity will heartily wish China success in throwing off the tobacco evil as she did the opium traffic.

* * * * * *

When a great nation spends three times as much to tear down its boyhood and girlhood, its manhood and womanhood, as it does to develop the mind, the body, and the soul of its citizens, it is time to call a halt.

Well, my good friends, there is another phase of the matter that seems to indicate that "even grown-up manhood" needs protection. In the No-Tobacco Journal, April number, is an article, a part of which I give below:

SAYS TOBACCO "CURE" IS FAKE.

The Tobacco Leaf, issue of March 10, 1921, had the following:

"The Federal Government is on the trail of the fake tobacco cure exploiters and already has one of these nostrums up a tree. After an investigation which has been in progress since early last summer, W. H. Lamar, solicitor of the Post Office Department, has recommended to the Postmaster General the issuance of a fraud order against Edward J. Woods, Inc., promoters of the 'Woods Set of Medicines.' This Woods outfit has been one of the most conspicuous offenders in the practice of advertising its remedies by means of blood curdling descriptions of the terrible effects of tobacco upon the tobacco devotee.*

"Solicitor Lamar's recommendation comprises 17 typewritten pages in which the fraudulent nature of the 'tobacco cure' 'business and 'tobacco cure' advertising is laid bare. His report concludes as follows:

" 'The evidence shows that none of these so-called "treatments" contain any drug or combination of drugs which will create an "abhorrence" or "associated distaste" for tobacco, and that the principal feature of the "C" and "CCC Treatment" is the direction to stop the use of tobacco. In effect, the patient pays his five dollars to be told to quit tobacco.

" 'The postmaster at New York reports that this concern receives on an average of 200 letters a day.' "

We do not know whether the Woods set of medicines are a fraud or not, but it is very certain that the tobacco trade will do everything possible to put the tobacco habit cure people out of business.

Even tho this particular tobacco habit cure should prove a fake, it does not follow that all are fakes or that the tobacco habit is not a real disease for which a cure is needed. The tobacco trade deliberately carries the impression that all "tobacco cure exploiters" are fakes.

It is certainly true that a very large majority of tobacco users find that they are unable to quit of their own strength. It will be noted in the above quotation that the Woods Corporation "receives an average of 200 letters a day." This is unmistakable evidence that a large number of tobacco users realize the fact that they are in the clutches of a silly, filthy, injurious habit and that they desire aid in their efforts to get rid of it.

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*Their testimonials from patients were no doubt damaging to the tobacco trade.

The government is right in its efforts to suppress any fake remedy that may be put on the market, but it will make a serious mistake if it proceeds against all tobacco remedies on the ground that they are all fakes. The government would do itself honor by instituting research for an effectual remedy for the tobacco habit. They spend millions to find and administer remedies for diseases of hogs, cattle, sheep, dogs, etc. Why not look for a remedy for the tobacco habit which is a disease from which hundreds of men are seeking relief every day?

Later. The Tobacco Leaf in its March 17 issue, announces that a fraud order has been issued against the Edward J. Woods, Inc., that prohibits the postmaster of New York from delivering mail and paying money orders to that concern.

It seems from above that Solicitor Lamar may have helped the tobacco people as the notorious Palmer has helped the brewers or at least *tried* to help them. Lest it be taken for granted that I favor drugs or medicines to help escape the clutches of Satan, let me point with emphasis to "the Lamb of God that taketh away the sin of the world," and to my closing text. I have been thru the battle and know whereof I speak.

"From sinking sand, He lifted me,
With gentle hand He lifted me;
From darkest night to plains of light,
Oh, praise His name! *He* lifted *me*."

HOW TO TAKE A BATH.

Some months ago I saw a newspaper clipping in regard to a divorce recently granted. The good wife complained that her husband had not taken a bath for a whole year, and she could not induce him to "wash up." Well, I have heard of more than one *man* who had not taken a bath for a whole year, but I have never yet heard of a *woman's* being guilty of any such serious charge. May God bless the women! Whatever they do, they are pretty sure to keep clean and pure and sweet. Well, when I was at Battle Creek I told the good, clean doctor that I not only have some sort of bath all over every day of my life, but that I find it quite necessary for me to engage in some outdoor occupation that will bring at least a little sweat or perspiration every day of my life. And sometimes I do not feel real bright and well unless I get this little sweat bath forenoon and afternoon. The good doctor said that this was exactly the thing to do, and that I was wise in getting away from the cold North in order that I might have this necessary perspiration *out in the open air*, every day in the year.

By the way, in a recent very kind letter editor Collingwood of the Rural New Yorker, paid me the following high compliment:

> It is really a great surprise to me to have you say that you are 81. I am sure that no one would ever dream of such a thing from your letters and from your writings; and, after all, that is about the best test I know for vitality.

Well, now, I have made a discovery right along the same line; and, like a great part of my discoveries, they are not so very new after all. My discovery is this: In order to have the most perfect bath, you want to get outdoors, say in the harvest field, or something like it, on a very warm day, roll up your sleeves, and go to work until the sweat not only drips from the end of your nose, but so that the perspiration will pour forth from every pore in the body. While you are thus dripping wet, take a shower bath or get into a bath-tub. Of course you will want warm water or you may get a chill. The boys on the farm who go in swimming know what I have been trying to describe. Sometimes while helping during thrashing time, when they are covered with dirt and sweat, a plunge in some swimming pool near by brings about this exuberant feeling of health I have been trying to describe.

Now, the Battle Creek folks have got "one better" on the above, and they can give you just such a bath any day in the winter; but, of course, you would not get it out in the open air. Before taking the bath the patient is put in a little round tent, in a warm room of course, with a great lot of electric globes all around him. This little cloth tent is made tight all around, and very soon the sweat begins to pour not only from the end of your nose, but from all over the body. And now comes the good attendant. I suppose he must be *one* of the "fifty doctors," and he gives you a good-sized cup of cold water. He keeps urging you to drink all of it. This big drink of water causes still more sweat, and then he gives you another cup and urges you to drink that—all of it. I think I drank a full pint, and I never had such a sweat before. It seemed as if the water would pour down my throat (and it was just fun to take it, too), and in a twinkling of time it oozed out of every pore of my body. I was not only getting an external bath, but an internal one, and then I was taken out of the tent and conducted to a tub and scrubbed with soap and water until I was all in a lather from head to foot. And then I began to wonder how he was going to get all the soap clear out of the way. Well, the next part of the program was a shower bath where little jets of warm or hot water struck every portion of my body with sufficient force to do a most perfect job of washing. After being scrubbed off with dry towels I was pronounced clean, and I confess I did find myself most deliciously clean. It was right after that, or soon after, that I rode 200 miles in an automobile in one day; and, altho we passed over some of the worst roads a small part of the way that I ever rode over in my life in an auto, I felt "as spry as a cricket" when I reached home a little after dark.

Now, in summing up, what I have tried to make plain is this: The very best time in the world to get a perfect bath is when the pores of your body are all wide open and are exuding sweat. If you let that sweat dry on and then try to moisten it up again, say just before you go to bed, you can not get any such good results as by taking a bath when the sweat-pores are all wide open and discharging "wickedness." And I am not sure but there is much better chance of making a man a *Christian*, by frequent bathing such as I have described. While I do not believe in divorces, I might almost say under any circumstances, I do think the poor woman mentioned at the head of this article had *almost* as good a reason as any.

STILL ANOTHER NEW SWEET CLOVER.

The letter below, with appended newspaper clipping, is a surprise to me; and if it happens that it proves to be a paying investment just for the *seed* and *nothing else*, I think it is going to be one of the "happy surprises" to all beekeepers. Where the clover field is allowed to produce seed, of course we should get honey—all there is of it. As the names of parties and full particulars are supplied, there is no question about the exact truth of the statement. And we owe our thanks to our good friend Ness for giving to the beekeeping world what has already been done in the way of growing sweet clover for seed.

I herewith inclose a clipping from our local paper about a new kind of sweet clover.

Clifford Collins Farm is about 3 or 4 miles from my place, and I know all about the sweet clover which they grow.

I have a yard of bees right is Collins' orchard which does some good to the seed crop.

Certainly this white sweet clover is the kind for the farmer to grow. Another neighbor farmer got 3500 pounds of seed of this kind of sweet clover from less than 4 acres.

Those farmers are selling this seed for 30c and 32c per pound, and there is a big demand for it.

Morris, Ill., Sept. 14, 1920. L. L. NESS.

THIRTEEN BUSHELS TO A THE ACRE IS HIGH RECORD.

F. E. LONGMIRE,

Farm Adviser for Grundy County.

Thirteen bushels of sweet clover seed per acre on 52 acres is the record on a large acreage so far reported. The yield is reported the same on two different fields of 31 and 21 acres farmed by Asa Van Zandt and Peter Breit, respectively, on the Clifford Collins farms. This is not the common, large, coarse sweet clover, but a new strain that has been recently branded the Grundy County Sweet Clover. The origin of this clover is not known. It was bought for seeding by two individual farmers in this county five years ago and was not known to be different kind until it produced seed.

It has several distinct characteristics, that are noticeable. It is smaller than the large kind, the average height being around four feet; it is more uniform in size and in ripening seed; it is a heavy seed producer and ripens seed three weeks ahead of the large sweet clover. July 15 was the date for harvesting seed this year. This early ripening habit makes it possible to harvest and hull it before threshing the small grain.

LEAVES ARE SMALLER.

Another difference is that the leaves are smaller and narrower and a slightly different green from the large sweet clover. Being smaller and finer stemmed it makes better hay than the large kind, altho it is not as distinctly a hay crop as alfalfa. It has practically the same habits of growth and soil requirements as the large kind and is a good soil builder.

It is not so good a pasture crop as large sweet clover as it matures earlier, but for a seed-producing crop used in regular rotation it has decidedly superior qualities. It does not require clipping, which eliminates the hazard of killing at that time, and its height and uniform ripening make it an easy crop to harvest for seed. A great many farmers have become interested in this new type of sweet clover and are planning to seed some of it next year.

YIELD IS UNUSUAL.

Thirteen-bushels yields are unusual; however, five and six bushels per acre are quite common. William Hadden of Mazon harvested five bushels of excellent seed per acre on 60 acres. Maurice Walsh of Mazon harvested 6½ bushels on 40 acres. Robert McLuckie of Coal City and Alex Bell of Morris have splendid fields that are expected to yield heavily.

Several different kinds of sweet clover that a few years ago were classified as noxious weeds and were the subject of much hard work in attempting to destroy them, are now used as a regular crop and are improving the soil and making money for those growing them.

TWO CROPS IN ONE SEASON IN TEXAS.

In regard to the new annual sweet clover, we now have the second crop matured on the same ground, but the weather was so hot the second crop did not do as well as the first.

About Jan. 1st we transplanted some small volunteer plants, which by March 15th were beginning to bloom. Six weeks later these plants had reached a height of nearly six feet, and, as much of the seed had matured, we cut the ripest plants and re-seeded the ground, using the new-crop seed.

On account of extremely hot weather we did not secure a good stand, neither did the plants grow so thrifty as the first crop. They commenced blooming when about 12 inches high and finally reached a height of three feet, but the plants were spindling, and many of the seed have not matured well.

Bees worked the second crop fairly well, but nothing like they did the first.

From our experience, this season, I will say that results do not justify the effort required to grow the second crop.

BLOOMS AND MATURES IN BERMUDA GRASS TURF.

This is the hardiest clover I ever saw. Volunteer plants thrive in a *Bermuda grass turf*, and bloom and mature seed. No inoculation of soil is required here. J. D. YANCEY.

Bay City, Texas., Sept. 20, 1920.

BERMUDA NEW POTATOES.

On page 235, April Gleanings, I mentioned Bermuda potatoes, and took it for granted that the Bermuda barrels held about 11 pecks (165 pounds) like our American barrels; but, in Cleveland Plain Dealer for March 15, I find "New Bermudas, $14.00 a barrel of 100 pounds." The above price for not quite *seven* pecks would be over *$8.00 a bushel.* We can grow just as good ones here, and *you* can do it *right off now* if you get at it as soon as you see this.

"GROW A VEGETABLE GARDEN."

The above is the title of a very attractive little pamphlet of 44 pages, most beautifully illustrated on nearly every page. It is furnished by the International Harvester Co., Chicago, Ill. It will be sent postpaid for the small sum of 5 cents.

This same company furnishes also a most valuable pamphlet of 66 pages on sweet clover. The price of the latter, however, is 10 cents instead of 5. As this book was published in 1916 it does not touch on the *annual* sweet clover; but the facts it gives, especially in regard to nitrogen-gathering bacteria, with illustrations, are exceedingly valuable.

Classified Advertisements

Notices will be inserted in these classified columns for 30c per line. Advertisements intended for this department cannot be less than two lines, and you must say you want your advertisement in the classified column or we will not be responsible for errors. Copy should be received by 15th of preceding month to insure insertion.

REGULAR ADVERTISEMENTS DISCONTINUED IN GOOD STANDING.

(Temporary advertisers and advertisers of small lots, when discontinued, are not here listed. It is only regular advertisers of regular lines who are here listed when their advertisements are discontinued when they are in good standing.)

J. F. Moore, C. J. Baldridge, Howard H. Choate, S. J. Harris, H. C. Lee, F. J. Rettig, W. A. Hunter, J. Tom White, Jas. H. Kitchen, G. E. Williams, McAdams Seed Co., O. J. Arfsten, Jones & Stevenson, S. K. Blundin, Chas. W. Zweily, J. W. K. Shaw & Co., J. W. Romberger, Brazos Valley Apiaries, J. M. Berrier, Riverside Apiaries, L. J. Farmer, R. H. Shumway, C. C. Clemons Produce Co., W. F. & John Barnes Co., C. N. Flansburgh, N. O. Fuller, Electric Wheel Co., Eggers Bee Supply Mfg. Co., DeGraff Food Co., W. B. Wallin.

HONEY AND WAX FOR SALE.

FOR SALE—Honey in 5 and 60 pound cans.
Van Wyngarden Bros., Hebron, Ind.

FOR SALE—Fancy clover honey in 60-lb. cans.
Jos. Hanke, Port Washington, Wis.

FOR SALE—Choice clover-basswood blend honey in new 60-lb. cans. J. N. Harris, St. Louis, Mich.

FOR SALE—Choice clover extracted honey. State quantity wanted. J. D. Beals, Oto, Iowa.

FOR SALE—Clover and buckwheat honey in 60-lb. cans. Bert Smith, Romulus, N. Y.

FOR SALE—White clover comb honey.
W. L. Ritter, Genoa, Ills.

FOR SALE—Fine quality raspberry-milkweed honey in 5-lb. and 10-lb. pails and 60-lb. cans.
P. W. Sowinski, Bellaire, Mich.

FOR SALE—Best quality clover-basswood extracted honey. Two 60-lb. cans in case.
Gelser Bros., Dalton, N. Y.

FOR SALE—2000 lbs. choice white clover extracted honey. State quantity wanted. Sample 20c, applied on first order. C. H. Hodgkin, Rochester, O.

FOR SALE—500 lbs. clover-basswood honey, 5-lb. pails, delivered, $1.00 pail. Special price on lot. One ton fall honey in 60-lb. cans. Quote best offer.
H. S. Ostrander, Mellenville, N. Y.

FOR SALE—Extracted clover honey, 15c per pound; amber and buckwheat, 12½c per pound; two 60-lb. cans to case. Amber in 50-gal. barrels, 10c per pound. H. G. Quirin, Bellevue, Ohio.

FOR SALE—Extra choice extracted white clover honey, put up in new 60-lb. cans and 5-lb. pails. Sample, 20c, same to apply on first order.
David Running, Filion, Mich.

FOR SALE—Clover, basswood or buckwheat honey, comb and extracted, by the case, ton, or carload. Let me supply your wants with this fine N. Y. State honey. C. B. Howard, Geneva, N. Y.

FOR SALE—A No. 1 white-clover extracted honey in 60-lb. cans, 2 cans per case. State how much you can use and I will quote on same.
L. S. Griggs, 711 Avon St., Flint, Mich.

FOR SALE—White clover honey, almost water white. Put up in new 60-lb. tin cans, two to the case. Write for prices.
D. R. Townsend, Northstar, Mich.

FOR SALE—White honey in 60-lb. cans, sample and price on request. Also white clover comb, 24 sections to case. The A. I. Root Co., Inc., 23 Leonard St., New York City.

FOR SALE—Finest white clover extracted honey in 60-lb. cans. Price f. o. b. Holgate, Ohio. One can, $10.80, two cans, $20.00. 10 lbs. delivered to third postal zone, $2.50; 5 lbs., $1.25.
Noah Bordner, Holgate, Ohio.

FOR SALE—White honey, 15c a lb.; L. A. alfalfa, 14c, in two 60-lb. cans; Chilian in 165-lb. kegs, 10c; light amber honey in 50-gal. bbls., 80c a gal. Beeswax, 30c a lb.
Walter C. Morris, 105 Hudson St., New York City.

FOR SALE—Finest quality clover extracted honey in new 60-lb. tins at greatly reduced price to close out balance of 1920 crop. Say how much you can use and we will be pleased to quote you our lowest price. Address E. D. Townsend & Sons, Northstar, Mich.

HONEY FOR SALE—Immediate shipment f. o. b. N. Y., Calif. white orange, 60-lb. tins, 19c lb.; Calif. white sage, 60-lb. tins, 16c lb.; white sweet clover, 60-lb. tins, 14c lb.; Calif. L. A. sage, 60-lb. tins, 13c lb.; West Indian L. A., 60-lb. tins, 10c lb.; West Indian L. A., 10-lb. tins, 6 per case, 15c per lb. Hoffman & Hauck, Inc., Woodhaven, N. Y.

HONEY AND WAX WANTED.

BEESWAX WANTED—For manufacture into SUPERIOR FOUNDATION. (Weed Process.)
Superior Honey Co., Ogden, Utah.

BEESWAX wanted. Old combs (dry) and cappings for rendering. Also wax accepted in trade. Top market prices offered.
A. I. Root Co. of Iowa, Council Bluffs, Iowa.

WANTED—Shipments of old combs and cappings for rendering. We pay the highest cash and trade prices, charging but 5c a pound for wax rendered. The Fred W. Muth Co., Pearl and Walnut Sts., Cincinnati, O.

OLD COMBS WANTED—Our steam wax-presses will get every ounce of beeswax out of old combs, cappings, or slumgum. Send for our terms and our new 1921 catalog. We will buy your share of the wax for cash or will work it into foundation for you. Dadant & Sons, Hamilton, Illinois.

WANTED—Beeswax. We are paying 1 and 2c extra for choice yellow beeswax, and in exchange for supplies we can offer a still better price. Be sure your shipment bears your name and address, so we can identify it immediately upon arrival, and make prompt remittance.
The A. I. Root Co., Medina, Ohio.

FOR SALE.

HONEY LABELS—New designs. Catalog free.
Eastern Label Co., Clintonville, Conn.

FOR SALE—A full line of Root's goods at Root's prices. A. L. Healy, Mayaguez, Porto Rico.

ROOT'S goods at Root prices. A. W. Yates, 3 Chapman St., Hartford, Conn.

EIGHT twin-mating hives with frames, good as new, $12.00. Peterson, 14 Steele St., Worcester, Mass.

FOR SALE—SUPERIOR FOUNDATION, "Best by Test." Let us prove it. Order now.
Superior Honey Co., Ogden, Utah.

ROOT'S BEE SUPPLIES—For the Central Southwest Beekeepers. Beeswax wanted. Free catalog. Stiles Bee Supply Co., Stillwater, Okla.

FOR SALE—We have 85 modified Dadant hives of bees, L frame. Will sell part of them.
C. A. Bunch, Lakeville, Ind.

PUSH-IN-THE-COMB CAGES — Quickest and safest way to introduce queens, 50c postpaid.
F. R. Davis, 203 Oak St., Weehawken, N. J.

BEEKEEPERS' SUPPLIES — Root's goods at factory prices. Send for 1921 catalog.
F. D. Manchester, Middlebury, Vt.

FOR SALE—100-gal. size galvanized honey tank, good as new. Best offer takes it.
Martin Fink, Cold Spring, Minn.

PORTER BEE-ESCAPES save honey, time, and money. Great labor-savers. For sale by all dealers in bee supplies.
R. & E. C. Porter, Lewiston, Ill.

FOR SALE—A few supplies, one Cowan extractor, No. 15, in good condition, $25. One observation hive-body, $10.00.
Foster Crumley, Athens, Ohio.

FOR SALE or on shares, 14 apiaries, one or all. Healthful location with American school and church in town, on stone road. Last crop over 40 tons. M. C. Engle, Herradura, Cuba.

FOR SALE — Good second-hand double-deck comb-honey shipping cases for 4¼ x 4¼ x 1⅞ sections, 25c per case, f. o. b., Cincinnati. C. H. W. Weber & Co., 2146 Central Ave., Cincinnati, Ohio.

FOR SALE—Good second-hand empty 60-lb. honey cans, two cans to the case, at 60c per case f. o. b. Cincinnati. Terms, cash with order. C. H. W. Weber & Co., 2146 Central Ave., Cincinnati, Ohio.

FOR SALE—36 standard 10-frame deep hive-bodies with self-spacing frames. Eight Excelsior covers, ten reversible bottoms, all new. $80.00 for the lot, f. o. b. Robinson. Henry McIntosh, Robinson, Ills.

FOR SALE—One hundred new standard two-story, ten-frame hives, metal-covered, nailed, painted, with Hoffman frames, wired, with full sheets foundation. In lots of five or more, $5.00 each, f. o. b. Mobile. H. A. Goering, Crichton, Ala.

FOUNDATION-MAKING OUTFIT CHEAP—Complete hand outfit, fit to produce on commercial scale, excellent condition, 3 mills, 3 tanks, gasoline stove, boards, etc. Write for particulars; $125.00 takes; worth $250. H. F. Mellon, Acton, Cal.

FOR SALE—700 A grade 4 x 5 x 1½ plain sections, $11.00; 300 P fences for 4¼ x 4¼ plain sections, a few of which are slightly discolored by exposure to air, $16.00.
Miss E. J. King, McArthur, Ohio.

FOR SALE—500 lbs. Dadant's light brood foundation for Hoffman frames, put up in boxes 50 lbs. net. Just as received from manufacturer. No orders accepted for less than one box at 75c per lb.
H. B. Gable, Romulus, N. Y.

FOR SALE—Equipment for large apiary, hundreds of hives, supers, excluders, extracting combs, four-frame reversible extractor, honey tanks, wax-press, steam uncapping knife, hundreds of frames were never nailed up. Lots of foundation. Have more than I need. Dave Goerner, Hematite, Mo.

FOR SALE—Owner wants use of outside warehouse. We must vacate and offer for quick sale: One-story 8-frame single-wall hives, per package of 5, $15.00; 10-frame size, $17.50. Staple-spaced frames, per package of 100, $9.00. 4 x 5 shipping cases with glass, per package of 25, $15.00. Goods first-class. Offer good only as long as this stock lasts.
A. G. Woodman Co., Grand Rapids, Mich.

FOR SALE—Novice two-frame extractor, used for less than 1,000 pounds. Reason for selling, have larger machine. A. W. Lindsay, 438 Mt. Vernon Ave., Detroit, Mich.

FOR SALE—175 white pine, single-story standard ten-frame hives. Never been used. They are dovetailed with reversible bottoms and metal-spaced frames. These are knocked down at $2.95 f. o. b. here. Paul D. Roban, Waverly, Minn.

FOR SALE—250 colonies of bees in best honey-producing section of Colorado. One apiary in 8-frame hives fully equipped for comb honey. Balance in 10-frame hives, equipped for extracted honey with complete extracting outfit. For particulars write to E. J. Cheek, Merino, Colo.

FOR SALE—New Langstroth hives in lots of 5. Five complete hive-bodies in flat with bottom-board and telescope cover. Ten plain-frame without foundation, $16.50. Five complete supers 4¼ x 4¼ plain section, without sections or foundation, $7.50.
C. J. Waffle, Evart, Mich.

FOR SALE—Danzenbaker supers for 4x5x1⅜ sections complete with section holders and fences. For use on ten-frame hives. 15 nailed and painted and never used. 33 used two seasons but in good shape. No disease about. Will sell all crated for shipment at $1.50 each.
Miss E. J. King, McArthur, O.

AUTOMOBILE REPAIRS

AUTOMOBILE owners should subscribe for the AUTOMOBILE DEALER AND REPAIRER; 150-page illustrated monthly devoted exclusively to the care and repair of the car. The only magazine in the world devoted to the practical side of motoring. The "Trouble Department" contains five pages of numbered questions each month from car owners and repairmen which are answered by experts on gasoline engine repairs. $1.50 per year. 15 cents per copy. Postals not answered. Charles D. Sherman, 107 Highland Court, Hartford, Conn.

WANTS AND EXCHANGES.

WANTED—Hand and power extractor, also engine. N. Krautwurst, Annandale, N. J.

WANTED—Old combs and cappings for rendering on shares. Our steam equipment secures all the wax. Superior Honey Co., Ogden, Utah.

WANTED—To quote special prices on queen cages in quantity lots, to breeders. State quantity wanted. A. G. Woodman Co., Grand Rapids, Mich.

FOR SALE OR EXCHANGE—One foundation machine for cash or good 5 x 7 View camera.
Thos. H. Evans, Batesville, Ark.

EXCHANGE—New annual white sweet clover seed, for bees and queens, or bee books.
E. Thornton, Addison, N. Y.

WANTED—The May to December, 1920, numbers, inclusive, of Gleanings. Must be in good condition. A. T. Copeland, Burley, Wash.

QUEENS WANTED—Lowest price on 50 to 200 queens. Also colonies of bees, black, hybrids, or Italians. Charles Schilke, Matawan, N. J.

WANTED—200 or more colonies of bees within 100 miles of Flint to work on shares for extracted honey, for season 1921. Address Leonard S. Griggs, 711 Avon St., Flint, Mich.

BEES WANTED ON SHARES—100 to 200 colonies in southeastern Michigan for season of 1921. Years of experience, County Apiary Inspector. Now own 180 colonies.
Earl F. Townsend, 417 Gillespie Ave., Flint, Mich.

REAL ESTATE

FOR SALE—Farm and 50 colonies of bees with equipment for 100 or more. Good location. A. L. Weidler, McBain, Mich.

FOR SALE—Sausalito, Calif., half hour from San Francisco, two flat buildings, frame construction, four rooms each. Living rooms beam ceilings, brick fireplaces, wood wainscot. Thoroly modern, good condition. Charmingly situated on a gore lot, overlooking S. F. Bay; $3500 cash or terms to right parties. L. H. Betts, 766 Pine St., San Francisco, or Wm. B. Betts, 1615 Ashland Block, Chicago, Ills.

MISCELLANEOUS

FOR SALE—One pair white ferrets, price $10, paid $25. Eddie Johnson, Lansing, R. D. No. 2, Ia.

FOR SALE—Carneaux pigeons, 50 pairs red and yellow, fine birds, $2.00 a pair. W. E. Genthner, Saugerties, N. Y.

FOR SALE—6 x 10 Excelsior printing press, types, rules, new, for cash. Edwin Dahlquist, North Branch, Minn.

FOR SALE—Avery 5 x 10 farm tractor, with pulley attachment. W. V. Binkerd, West Monterey, Pa.

CHOCOLATES—Pure honey centers, delicious confection and a beautiful package. $1.00 per pound, postpaid. "Endion," Naples, N. Y.

HONEY, ROOTS, FURS—Beemen, why not increase your profits? A 32-page booklet describing books on Bee Hunting, Medicinal Root Growing, Fur Farming, Tanning, Trapping, etc., free. A. R. Harding, Publisher, Columbus, Ohio.

MANUAL training teacher, 21, strong, good knowledge of mechanics, interested in bee culture, wishes position after June 17, where he can learn the business. Minnesota vicinity preferred. Please give full particulars as to wages, location, and possibilities. G. G. Swenson, Garfield School, Minneapolis, Minn.

SWEET clover combined huller and scarifier for hand use, one extra set of lining and two screens included, each $3.75, postage extra. Brass dropping tubes with tin funnel drops all kinds of small seeds on exact spot in windy weather without bending your back. Each, $1.00 postpaid. S. Rouse, Ludlow, R. D. No. 2, Ky.

BEES AND QUEENS.

FINEST Italian queens. Send for booklet and price list. Jay Smith, R. D. No. 3, Vincennes, Ind.

WHEN it's GOLDEN, it's PHELPS. C. W. Phelps & Son, Binghamton, N. Y.

FOR SALE—Italian queens and nuclei. B. F. Kindig, E. Lansing, Mich.

HARDY Italian queens, $1.00 each. W. G. Lauver, Middletown, Pa.

GOLDEN Italian queens, untested, $1.50 each; dozen, $14.00. E. A. Simmons, Greenville, Ala.

FOR SALE—1921 Golden Italian queens, price list free. Write E. E. Lawrence, Doniphan, Mo.

THAGARD ITALIAN QUEENS—See display advertisement elsewhere.

PACKAGE BEES and PURE ITALIAN QUEENS. Booking orders now for spring delivery. Circular free. J. E. Wing, 155 Schiele Ave., San Jose, Calif.

PHELPS' GOLDEN QUEENS will please you. Mated, $2.00. C. W. Phelps & Son, Binghamton, N. Y.

MY famous Italian queens, June 1 and later, $1.50 each, six for $8.00. J. W. Romberger, Apiarian, 3113 Locust St., St. Joseph, Mo.

FOR SALE—Eight 8-frame hives, complete. Italian bees. M. F. Ryan, Moorestown, R. D. No. 2, Box 88, N. J.

BOOKED to capacity on package bees. Thanks. Orders for few choice queens considered later. Jes Dalton, Bordelonville, La.

IF you want queens that will produce results, give THAGARD'S ITALIAN QUEENS a trial. V. R. Thagard, Greenville, Ala.

FOR SALE—3-frame nuclei with tested Italian queens, $6.00 f. o. b. Agricultural College, Miss. Dr. Chas. F. Briscoe, Agricultural College, Miss.

FOR SALE—Bright Italian queens, $1.50 each; $14.00 per doz. Ready after April 15. T. J. Talley, Greenville, R. D. No 3, Ala.

FOR SALE—Golden or three-banded virgins, 60c each, or $6.00 per dozen. Safe arrival. R. O. Cox, Luverne, Ala., R. D. No. 4.

BEES AND QUEENS from my Carolina apiaries—progeny of my famous Porto Rican pedigreed-breeding stock Elton Warner, Asheville, N. C.

FOR SALE—Hardy Northern-bred Italian queens and bees Each and every queen warranted satisfactory. For prices and further information, write. H. G. Quirin, Bellevue, Ohio.

FOR SALE—Leather-colored Italian queens, tested, until June 1, $2.50; after, $2.00; untested, $1.25; 12, $13.00. Root's goods at Root's prices. A. W. Yates, 15 Chapman St., Hartford, Conn.

BUSINESS-FIRST queens, untested, $1.50 each; select untested, $1.75; tested, $2.25; select tested, $2.50. Safe delivery guaranteed, orders filled promptly. M. F. Perry, Bradentown, Fla.

FOR SALE—A. I. Root Co. strain of leather-colored Italians. Virgins only, May to October 1, 75c; 10, $7.00; 100, $65.00. P. W. Stowell, Otsego, Mich.

BEES BY THE POUND — Also QUEENS. Booking orders now. FREE circulars give details. See larger ad elsewhere. Nueces County Apiaries, Calallen, Texas. E. B. Ault, Prop.

NUCLEI—Strong 4-frame nuclei in May and June, hybrids, $6.00; Italian, $7.00. Can supply 100 nuclei from that number of colonies. B. F. Averill, Howardsville, Va.

FOR SALE—Golden or three-banded queens, untested only. Order now for shipment June 1 or later. One, $1.50; six, $8.00; 12, $15.00. Ross B. Scott, LaGrange, Ind.

COLORADO QUEENS—Pure Italians. Our sunny climate and altitude produce the best there are. Write now for price list. C. I. Goodrich, breeder of fine queens, Wheatridge, Colo.

FOR SALE—Three-banded Italian queens, untested, $1.50 each; 6, $7.50; 12, $14.00. Select untested, $1.75 each. Satisfaction guaranteed. W. T. Perdue & Sons, R. D. No 1, Fort Deposit, Ala.

FOR SALE—Golden queens, untested, $1.15; 6 or more, $1.10 each; select untested, $1.60; 6 or more, $1.50 each. Safe arrival. Hazel V. Bonkemeyer, Randleman, R. D. No. 2, N. C.

ORDER booked now for delivery June 1, 3-frame nuclei and queen, $7.50; select tested, $8.50. Dr. Miller's strain. No pound packages. Low express rates and quick transit to north. S. G. Crocker, Jr., Roland Park, Baltimore, Md.

THAGARD'S ITALIAN QUEENS produce workers that fill the supers quick.
V. R. Thagard, Greenville, Ala.

FOR SALE—2-lb. packages Italian bees and queens by parcel post, postage paid, delivery April 15, for $8.50; 2-frame nuclei with Italian queen by express, not prepaid, delivery May 5, $9.00.
Otto J. Spahn, Pleasantville, N. Y.

FOR SALE—200 Italian nuclei, 2-frame, $5.00; 3-frame, $7.00; untested queens, $1.50; tested, $2.00. Prompt delivery. Supplies at cost.
R. Kramske, 1104 Victor St., St. Louis, Mo.

JUST to let all my customers know I am still breeding three-banded Dr. Miller stock queens. One untested queen, $2.00; 6 for $11.00. Selects 25c each higher. Curd Walker, Jellico, Tenn.

IF good three-banded Italian queens are wanted, send your order to M. Bates & Sons, Greenville, R. D. No. 4, Ala. One dozen queens, $14.00; 100, $100. Pure mating, safe arrival, and satisfaction guaranteed.

FOR SALE—Bees for May and June shipment. Two pounds bees and an untested Italian queen shipped by express on drawn comb with stores. Certificate of health with each shipment.
Ross B. Scott, LaGrange, Ind.

WE believe we have the best Italian queens obtainable. Our new system is working wonders. Book your order now for 1921. Untested, $1.50; tested, $3.00; virgins, imported mothers, 50c.
F. M. Russell, Roxbury, Ohio.

WE are now booking orders for early spring delivery of two and three frame nuclei, with untested or tested queens. Write for prices and terms. We also manufacture cypress hives and frames.
Sarasota Bee Co., Sarasota, Fla.

ITALIAN QUEENS OF WINDMERE are superior three-banded stock. Untested, $1.50 each; 6 for $8.00; tested, $2.50 each; select tested, $3.00. Bees by the pound. Write for prices.
Prof. W. A. Matheny, Ohio University, Athens, O.

DAY-OLD ITALIAN QUEENS—High quality, low price, satisfied customers. Safe arrival guaranteed in U. S. and Canada. Safe introduction. Prices 1, 75c; 12, $7.20; 100, $60. Write for circular early. James McKee, Riverside, Calif.

1921 price of bees and queens from the A. I. Root Co. leather-colored stock. 1 lb. bees with queen, $5.00; 2 lbs., $7.50. Untested queens, $1.50 each; dozen, $15.00. Safe arrival. Orders booked now.
Greenville Bee Co., Greenville, Ala.

FOR SALE—Three-banded Italian bees and queens, April and May, 1 untested queen, $1.50; tested, $2.50; 2 lbs. bees, $4.50. Add price of queen wanted. Safe delivery and satisfaction guaranteed. J. L. Leath, Corinth, Miss.

"NOT the best in color or possibly not the gentlest, but mothers of colonies that bring in the honey," is what my customers tell me of my queens. My circular tells about them. R. V. Stearns, Brady, Texas.

QUEENS—THE FAMOUS BRENNER strain of Italians. Equaled only by the best. Untested, $1.50 each; $15.00 per dozen. Tested, $2.50 each. Satisfaction guaranteed. Dr. A. Wright, Kingsbury, Texas.

FOR SALE—A limited number of leather-colored Italian queens. The kind that gets honey. L. C. Keet in 1919 produced 40,000 pounds of honey from 200 colonies. Geo. B. Howe, Sacket Harbor, N. Y.

ITALIAN QUEENS—Recognized honey-gathering strain, June 10 (a little earlier if possible) until close of season. Untested, each, $1.75; 6, $10.00; 12, $18.50.
R. F. Holtermann, Brantford, Ont., Can.

FOR SALE—Three-banded Italian queens, after May 25, untested, 1.50; 6, $8.00; 12, $15.00. Tested queens, $3.00 each. The above queens are all select. Robt. B. Spicer, Wharton, N. J.

FOR SALE—Unsurpassed Italian queens, ready June 1. Untested, 1, $1.50; 6, $7.50; 12, $14.00; 50, $55.00; 100, $105.00. Tested, 1, $2.50; 6, $13.50. My queens are actually laying before they are sent out. J. D. Harrah, Freewater, Oregon.

FOR SALE—Root's strain of Golden and leather-colored Italian queens, bees by the pound and nuclei. Untested, $1.50 each; select untested, $2.00; tested, $2.50 each; select tested, $3.00. For larger lots write. Circular free.
A. J. Pinard, 440 N. 6th St., San Jose, Calif.

FOR SALE—Italian queens, untested, in June, 1, $1.50; 6, $8.25; 12, $16.00; tested, $2.50 each. From July 1 to Oct. 1, untested, 1, $1.25; 6, $7.00; 12, $13.50. Tested, $2.00. Safe delivery and satisfaction guaranteed. Ready June 1 to June 10. R. B. Grout, Jamaica, Vt.

BEES FOR SALE—100 colonies in Standard dove-tailed hives, Hoffman frames, wired combs, good condition, painted, $11.00, in lots to suit. 50 Miller feeders. Never unpacked, $18.00, or 50c each in lots to suit. Alexander feeders at 40c each, new.
Cosy Nook Apiaries, Blackfoot, Idaho.

SHE-SUITS-ME queens, season of 1921. Untested Italians, $2.00 each, 10 or more, $1.75 each, from May 15 to June 15. After June 15, $1.50 each, up to nine queens; 10 to 24 queens, $1.40 each; 25 and up, $1.25 each.
Allen Latham, Norwichtown, Conn.

FOR SALE—2 lbs. bees on comb, $4.00; 3 lbs. on comb, $5.50. Untested queen with bees, $1.25, without bees, $1.50. Tested queen, $2.00. No disease in this country. Orders of 50, 5 per per discount. 100 packages, 8 per cent. If bees arrive in bad order, will replace or refund money.
F. M. Morgan, Hamburg, La.

PHELPS' GOLDEN ITALIAN QUEENS combine the qualities you want. They are GREAT HONEY-GATHERERS, BEAUTIFUL and GENTLE. Virgins, $1.00; mated, $2.00; tested, $5.00. Breeders, $10 to $20. Safe arrival guaranteed only in the U. S. and Canada.
C. W. Phelps & Son, Binghamton, N. Y.

ITALIAN QUEENS—Three-banded, select untested, guaranteed. Queen and drone mothers are chosen from colonies noted for honey production, hardiness, prolificness, gentleness, and perfect marking. Price, May and June, $1.50 each; 12 or more, $1.25 each. Send for circular.
J. H. Haughey & Co., Berrien Springs, Mich.

"QUEENS, QUALITY FIRST QUEENS." High-grade, pure, three-banded and golden Italians. These queens are as good as can be bought; are gentle, prolific, and good honey-gatherers. I guarantee safe arrival and satisfaction. Why not try these and be convinced? Untested, $1.25 each; 6, $6.50; 12, $12.50. Selected untested, $1.50; 6, $8.00.
G. H. Merrill, Pickens, S. C.

TWO-FRAME NUCLEI with untested Italian queens from the apiary of E. R. King, formerly inspector in Ohio and later in charge of Apiculture at Cornell University. No disease in territory. May delivery, $7.50; June, $6.50; July, $5.00. 50 per cent cash with order. If queen is not wanted, deduct $1.25 from above prices.
Miss E. J. King, McArthur, Ohio.

FOR SALE—Honey-Brook Farm can supply you promptly, beginning April 10, with the very best three-banded Italian queens, one grade, select untested, $1.50 each, or $15 per dozen; tested, $2.00 each straight; ready April 1. Should you find some queenless colonies this spring, send me your order for a young queen to save them. I will not disappoint you. I have the bees and can deliver the goods. Pure mating, safe arrival, and satisfaction guaranteed. Jasper Knight, Hayneville, Ala.

FOR SALE—Packages, nuclei, and pure-bred queens—queens from Root Home-bred breeders. Untested, $2.00; tested, $3.00; select tested, $3.50. Safe arrival and mating guaranteed. The Southland Apiaries, Hattiesburg, Miss., W. S. Tatum, Prop.

FOR SALE—Three-banded leather-colored bees and queens of the J. P. Moore strain, hardy, prolific, hustlers, no disease. Safe arrival and satisfaction guaranteed. For prices see larger ad elsewhere. J. M. Cutts, Montgomery, R. D. No. 1, Ala.

ITALIAN QUEENS—I am raising a limited number of queens to requeen my own yards from queens with big records. Will have a limited number for sale. Mated, 1, $2.00; 2, $3.50; 6, $7.00; 12, $15.00. Orders filled as received, ready to ship June 15. A. R. Wilcox, Birchardville, Pa.

THREE-BANDED Italians only, that have been bred to a high standard of excellence. Never had disease in my apiaries. Safe arrival and satisfaction guaranteed. Untested queens, $1.50; 12, $15.00; tested queens, $2.25; 12, $25.00.
Jul Buegeler, New Ulm, Texas.

FOR SALE—Three-band Italian bees and queens, ready June 1. Fine stock, free from disease and guaranteed to please you. (One grade) select untested queens, $1.50 each; 6, $8.00; 12, $15.00; 50, $60.00. Nuclei, $3.00 per frame, Hoffman; bees, $3.00 per pound. A. E. Crandall, Berlin, Conn.

THREE-BANDED ITALIAN bees and queens. Two standard Hoffman frame nuclei, with untested queen, $5.50; three-frame, as above, $6.50. Orders booked in rotation. All dead bees will be replaced. Can furnish government inspection certificate of no disease. L. C. Mayeux, Hamburg, La.

WHEN BETTER QUEENS are raised Victor will raise them. Three-banded Italians only, mated, $1.25 each; 6, $7.00; 12, $13.50; 100, $110.00. Tested, $3.00. Breeders, $10 to $25. Safe arrival guaranteed only in U. S. and Canada.
Julius Victor, Martinsville, N. Y.

FOR SALE—Italian bees and queens. 3-lb. pkgs. with untested queen shipped on comb of honey in Hoffman frame, at $7.00 each; 2-frame nucleus with untested queen, $6.50 each; 3-frame nucleus with untested queen, $8.00 each. No disease and safe arrival guaranteed. J. L. St. Romain, Apiarist, White Clover Farm & Apiary, Hamburg, La.

FOR SALE—Mr. Beeman, send your order early. First arrived, first served. Make shipment from April 25 to June 1. Several years' experience. 2-lb. package three-band Italian bees, 1 frame of honey, 1 untested queen, $5.50; 25 per cent discount on each package. Guarantee safe arrival.
A. J. Lemoine, Moreauville, La.

FOR SALE—2-lb. package of bees with untested three-banded Italian queen, $5.75; 3-lb. same as above, $7.00; 5-lb. as above, $9.00. All bees are shipped on a frame of brood and honey, standard Hoffman frame. Safe delivery guaranteed, free from disease of any kind. We are now ready to ship. C. A. Mayeux, Hamburg, La.

NORTH CAROLINA bred Italian queens of the Dr. C. C. Miller strain of three-band Italian bees. Gentle and good honey-gatherers, from May 1 until June 1. Untested, $1.50 each; $15.00 per doz.; selected untested, $1.75 each; $17.50 per doz.; tested, $2.25 each; $22.50 per doz.; selected tested, $3.00 each. Safe arrival and satisfaction guaranteed. L. Parker, Benson, R. D. No. 2, N. C.

IF you think PHELPS' GOLDEN QUEENS are BEAUTIFUL, GENTLE, and just what you want to IMPROVE YOUR STOCK, we will do our best to supply you if you will give us time to fill your order in its turn. Mated (untested), $2.00 each; virgins, $1.00 each; tested, $5.00 each; select breeders, $10.00 to $20.00 each. We will commence sending queens just as early as weather will permit us to rear good ones. C. W. Phelps & Son, 3 Wilcox St., Binghamton, N. Y.

FOR SALE—Dark Italian queens, Brenner strain. Untested, $1.50. Breeders, $3.00. Two-frame nuclei, $7.50. Add price of queen desired. For larger orders apply for prices. My guarantee: Every queen, dead or alive, returned at once in original cage, will be replaced or money refunded. Can ship at once. Any amount. Full instructions will accompany every nucleus.
Mrs. J. T. FitzSimon, Castroville, Texas.

PACKAGE bees and queens; 2 lbs. of Italian bees with tested Italian queen, $5.00; 2 lbs. hybrids or blacks with tested Italian queen, $4.00. These mixed bees with tested Italian queens are a bargain at this price, as the hybrids will soon be replaced by pure Italians. No disease and safe arrival guaranteed. Ship by express only. Send cash with order. Elevation Apiaries, Milano, Texas, A. R. Graham, Mgr.

FOR SALE—Pure Italian queens, Golden or leather-colored, packages and nuclei; 1 untested queen, $1.50; 6, $7.50; 12, $13.50; 50, $55.00; 100, $100; virgins, 50c each; packages 24 and under, $2.25 per pound; 25 and over, $2.00 per pound; nuclei, 1-frame, $4.00; 2-frame, $6.00; 3-frame, $7.50; queens extra. One-story 10-frame colony with queens, $12.00. Golden Star Apiaries, R. 3, Box 166, Chico, Calif.

QUEENS—Three-banded Italians only. Now that the booking season for nuclei has passed, and while I have a large number of orders for nuclei, I shall not be too busy with these to fill your orders for queens. 1 untested for April, $1.25; 12, $12.50; 1 untested for May 1 to June 1, $1.00; 12, $10.00; I ship no queens after June 1; weather is too hot. Discount on large orders. Safe arrival guaranteed.
L. R. Dockery, Carrizo Springs, Texas.

FOR SALE—Bright Italian queens and bees, untested queens, $1.50 each; $15.00 per dozen; 1 lb. bees, $5.00; 2 lbs. bees, $9.00. If queen is wanted with bees add the price of queen. We guarantee safe arrival and reasonable satisfaction in U. S. and Canada. Cash or certified check must accompany the order for prompt shipment, unless parties are known or satisfactorily rated.
Graydon Bros., Greenville, R. D. No. 4, Ala.

FOR SALE—1921 prices on nuclei and queens, 1-frame nucleus, $3.00; 2-frame nucleus, $5.00; 3-frame nucleus, $6.50, without queens f. o. b. Macon, Miss. 5 per cent discount in lots of 25 or more. Untested queens, $1.50 each; $15.00 per dozen; tested, $2.00 each; $22.00 per dozen. No disease. Inspection certificate with each shipment. Safe arrival and satisfaction guaranteed in U. S. Queens sold only with nuclei.
Geo. A. Hummer & Sons, Prairie Point, Miss.

WE want to please you; our reliable three-banded queens and bees will be ready May 1. All bees are shipped on a standard frame of brood and honey. 1-lb. package bees, no queen, $3.25; 2-lb., $4.50; 3-lb., $5.75. One-frame nuclei, no queen, $2.75; 2-frame, $4.00. Queens untested, each, $1.50. A few hybrid bees from outyards; but remember, all queens are reared from our home queen yard. Safe delivery guaranteed; also free from disease of any kind; 25 per cent with order, balance 10 days before shipping date. A few selected tested queens at $2.50 each. Oscar Mayeux, Lock Box No. 15, Hamburg, Louisiana.

PRITCHARD QUEENS (Three-banded Italians) —My first season selling direct to the trade, June price: 1 untested, $1.75; 6 for $9.50; 1 select untested, $2.00; 6 for $11.00. After July 1: 1 untested, $1.50; 6 for $8.00; 1 select untested, $1.75; 6 for $9.50. Write for prices on larger quantities. I have a few extra-select tested queens one year old at $5.00 each. Queens clipped free of charge on request. Acknowledgment and directions for introducing sent on receipt of order. Safe delivery and satisfaction guaranteed. Let me book your order now for early delivery, specifying the date of shipment desired. Otherwise orders will be filled in rotation. Arlie Pritchard, Medina, Ohio.

PACKAGE BEES—Dependable Italian queens.
E. A. Harris, Albany, Ala.

FOR SALE—From 1 to 50 colonies Italian bees in standard hives; 10-fr., $10.00 per colony; 8-fr., $8.00, f. o. b. Merritt. J. H. Corwin, Merritt, Mich.

FOR SALE—Golden queens ready May 1: 1, $1.50; 6, $7.50; 12, $14.00; 100, $100. Virgins, 75c each. W. W. Talley, Greenville, R. D. No. 4, Ala.

CAN furnish limited number 2-fr. nuclei with untested queen, $5.00 after May 15, receiver to return shipping boxes. H. S. Ostrander, Mellenville, N. Y.

FOR SALE—Pure Italian queens and nuclei, 1 untested queen, $1.50; 12, $15.00; tested queens, $2.50 each; 2-frame nucleus, $5.00; 3-frame nucleus, $6.50. Add price of queen wanted to price of nucleus.
Frank Bornhoffer, R. D. No. 17, Mt. Washington, O.

QUEENS—Select three-banded Italians. Reared from the best mothers and mated to choice drones. Untested, 1, $2.00; 6, $9.00; 12, $16.80. After June 1, 1, $1.50; 6, $8.00; 12, $15.00. Select tested, $3.00 each. Write for prices per 100. Descriptive circular free. Hardin S. Foster, Dept. G, Columbia, Tenn.

I. F. MILLER'S strain Italian queen bees. Northern-bred for business; from my best SUPERIOR BREEDER (11 frames brood on April 7), gentle, roll honey in, hardy, winter well, not inclined to swarm, three-banded, 27 years' breeding experience. Satisfaction guaranteed. Safe arrival in U. S. and Canada. Untested, $1.50; 6, $8.00; 12, $14.00. Select, $1.75; 6, $9.00; 12, $17.00; 1 lb. bees, $3.50; 2 lbs., $5.50; 3 lbs., $7.50. (No queen.) I. F. Miller, Brookville, R. D. No. 2, Pa.

BIG BARGAIN IN SECTIONS—We have an odd lot stock A and B grade sections not manufactured for our regular grade, size 4¼ x 4¼ x 1⅞. They compare quite favorably with Root Quality sections. We recommend both the A and B grades as a bargain. The A grade is strictly fine, and the B grade is quite as good except for color and imperfections. Stock limited and we urge quick action. A grade in crates of 500 at $7.65; B grade at $7.50. Available only in crates of 500. The A. I. Root Company, 224-230 W. Huron St., Chicago.

A BARGAIN—I shall select 40 of the best colonies in one of our out-yards this year to run for increase. Now I want the queens in these all sold, so I can remove them all at the same time to start cells for increase. They are all less than one year old, right in the prime of their life. Mothers of prime colonies, the pick of the whole yard, and purely mated, descendants of the famous Moore strain of leather-colored Italians. In order to have those queens all sold when I want to remove them I am going to offer them at a bargain. I will sell them for $1.50 each, cash with order. Orders may be sent now; first ones to send get the queens. Queens will be mailed sometime about the 15th or 20th of June, dependent on the season and weather. Safe arrival and satisfaction guaranteed.
Elmer Hutchinson & Son, Lake City, Mich.

HELP WANTED.

WANTED for the season of 1921 an experienced queen-breeder. State experience had, reference, age, height, weight.
W. J. Forehand & Sons, Ft. Deposit, Ala.

WANTED—One experienced man, and students or helpers, in our large bee business; good chance to learn. Modern equipment and outfit, including auto truck; located near summer resorts. Write giving age, height, weight, experience, reference and wages wanted. W. A. Latshaw Co., Clarion, Mich.

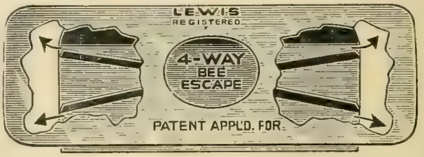
WANTED—One experienced man and students, clean habits, able-bodied and willing workers, as helpers with our more than 1000 colonies. Opportunity to learn the business from A to Z. 1920 crop 122,000 pounds. Theory also. Write immediately giving age, height, weight, habits, former employment, experience, references, wages, photo, all in first letter. E. F. Atwater (former Special Field Agent in Beekeeping, U. S. Dept. Agr.), Meridian, Idaho.

SITUATIONS WANTED

POSITION WANTED—Wanted work in an apiary by man who has had 40 years' experience in both extracted and comb-honey production. For full particulars write Geo. Whitcomb, 17 South St., Warren, Pa.

POSITION WANTED—Mr. Beekeeper, what would you offer for such help. Wish to work with bees, experienced, willing to build any building, when not busy with bees, or do carpentry work. Have all kinds of tools. W. March, 3844 Orange Ave., Cleveland, Ohio.

LEWIS 4-WAY BEE ESCAPES



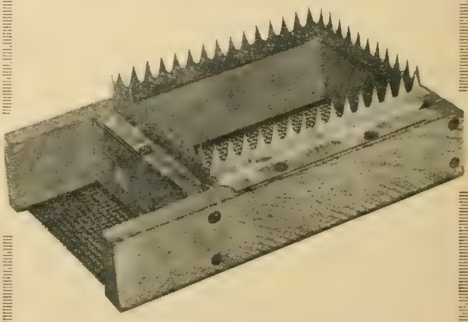
Four exits from supers. Fits all standard boards. Springs of coppered steel. Made of substantial metal. Made by

G. B. Lewis Company, Watertown, Wis., U.S.A.

Sold only by Lewis "Beeware" Distributors.

Stop Losing Valuable Queens!

This can be done by the use of the Jay Smith Push-in-the-Comb introducing cage. This cage has been thoroughly tested, and will give very satisfactory results. For complete information on



this cage, see pages 498 to 500, August, 1919, "Gleanings in Bee Culture." Price complete, 75 cents each; ten, $7.00; one hundred, $60.00.

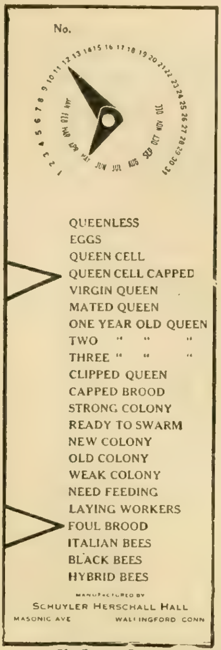
The A. I. Root Company
West Side Station
MEDINA OHIO

Happy Hours in California—Continued from p. 285.

view. They said: "Surely you are not going to leave this region until after 'Blossom Day.' People come from all parts of the country to see blossom time in the Santa Clara Valley." Unfortunately a business man's plans are not flexible enough to take in all the "blossom days" and other delightful occasions which his wife might enjoy; but there were enough of the prune trees in bloom to help us imagine what the broad valley and surrounding foothills must be like, clothed in the fragrant white of the fruit bloom, with the background of purple mountains.

DOWN in southern California a nice brother-in-law took us for more long drives thru the orange groves, beautiful towns, mountains, canyons, valleys, and beaches. Perhaps one of the most beautiful drives in that region is from the beach near Santa Monica thru Topango Canyon up to the heights overlooking the San Fernando Valley. On such a ride I always think gratefully of the vision into the future which the Californians must have had to make such beauty spots so accessible with perfect roads. The road winds up from the floor of the canyon, enclosed by steep hills on either side, with a deep mountain brook sometimes on one side of the road, sometimes on the other, as we crossed bridges. At one point we stopped

(Continued on page 310.)


No.
QUEENLESS
EGGS
QUEEN CELL
QUEEN CELL CAPPED
VIRGIN QUEEN
MATED QUEEN
ONE YEAR OLD QUEEN
TWO " "
THREE " "
CLIPPED QUEEN
CAPPED BROOD
STRONG COLONY
READY TO SWARM
NEW COLONY
OLD COLONY
WEAK COLONY
NEED FEEDING
LAYING WORKERS
FOUL BROOD
ITALIAN BEES
BLACK BEES
HYBRID BEES
MANUFACTURED BY
SCHUYLER HERSCHALL HALL
MASONIC AVE WALLINGFORD CONN

You, Mr. Beekeeper, can simplify beekeeping and get more honey and make more money if you use HALL'S HIVE MARKER and keep better tab on your bees.

A great time saver. Satisfaction guaranteed. Price 25c. 100, $20.

Size 2¾x9 in.

Manufactured by

Schuyler Herschell Hall

Masonic Ave., Wallingford, Conn.

Thagard's Italian Queens

Bred for Quality

My three-banded queens are bred from imported stock; they are hardy, prolific, gentle, disease-resisting and honey producers. A good queen is the life of any colony; head your colony with some of our queens, place our queens against any queens you may obtain anywhere, **and note the results.** I do not breed for **quantity,** but breed for **quality.** My queens have proven this to thousands of beekeepers that have tried them. Book your order now for May and June delivery.

April 1st to July 1st.

	1	6	12
Untested	$2.00	$8.00	$15.00
Select Untested	2.25	10.00	18.00
Tested	3.00	16.00	28.00
Select Tested	5.00	25.00	50.00

Safe arrival, pure mating, and perfect satisfaction guaranteed. Circular free.

V. R. THAGARD - - - - Greenville, Alabama

"NOT the best in color or possibly not the gentlest, but mothers of colonies that bring in the honey," is what my customers tell me of my queens.

My circular tells about them.

R. V. STEARNS
Brady, Texas

QUEENS! QUEENS! QUEENS!

Have you secured all you need? I have them as fine as you can secure anywhere at a reasonable price. After May 15th you can get them at the following prices. If you want them earlier look on page 179, March issue, or you will find my ad in the April issue of Gleanings.

	1	12
Untested queens	$1.50	$13.50
Tested queens	2.50	26.00
Select tested	3.00	30.00

Breeders $5.00 to $10.00 at all times.

You will notice that I don't advertise any select untested queens. It is because all that I ship now are selected. If they are not the best, I don't ship them; and if they don't give you satisfaction and you write me, I will make it satisfactory to you.

H. L. MURRY
Soso, Mississippi.

GOLDEN QUEENS FOR 1921

Untested queens for delivery from April 20th to July 1st, $1.50 each, or 6 for $8.00; for hundred lots write for prices. I guarantee safe arrival and reasonable satisfaction, and all orders and inquiries will be answered promptly.

R. O. COX
Route 4, Luverne, Ala.

Don't Chop Your Grass!
Shave the Ground

with MARUGG'S SPECIAL grass blade, with DANGEL cutting edge.
Write for particulars THE MARUGG COMPANY, Dept B TRACY CITY, TENN.

(Continued from page 309.)

to pick bunches of the beautiful purple and blue lupines and admire the view, and my sister, in the goodness of her heart, insisted that I ride on the front seat where I could see more. To tell the truth, there were times when I saw nothing at all, for my eyes were tightly closed with fright. Loving the mountains as I do, I always accept any invitation for a mountain drive, and always shall, but the way the drivers in the West take the mountain curves fills me with awe at their daring. I don't see how they can be sure they are not going to meet another machine coming toward them around the curve, with disastrous results to one or both, and even without a collision it would be so easy for a machine to shoot off into space. We climbed so rapidly that we could sometimes see one or more sections of the road which we had just traversed below us, and we twisted around the hills until I had no idea of direction and little idea of whether we were going up or down. Several times I feebly remonstrated with my brother-in-law for driving so fast down a dangerous grade, only to be informed that we were climbing all the time. Whether it is because the road at times changes from a very steep grade to one less steep, or because of the steeper hill at the side of the road, it is always difficult

(Continued on page 312.)

NOTICE!
Pritchard Queens
are not just common queens named, but
A NOTED STRAIN
The result of years of careful breeding and selection.
Reared and offered for sale by
ARLIE PRITCHARD
Medina, Ohio.
See my classified ad, page 307 for prices and guarantee.

Glass and Tin Honey Containers

2½-lb. Cans, 2 dozen reshipping cases.............$1.45 case; crates of 100, $ 6.50
5-lb Pails (with handles), 1 dozen reshipping cases 1.35 case; crates of 100, 8.30
10-lb. Pails (with handles), ½ doz. reshipping cases 1.10 case; crates of 100, 12.75
60-lb. Tins, 2 per case—NEW, $1.30 case; USED, 50c.

WHITE FLINT GLASS, WITH GOLD LACQD. WAX LINED CAPS.

8-oz. Honey Capacity, Cylinder Style...............$1.50 per carton of 3 dozen
16-oz. Honey Capacity, Table Jar Service.............. 1.40 per carton of 2 dozen
Quart or 3-lb. Honey Capacity, Mason Style............ 1.00 per carton of 1 dozen

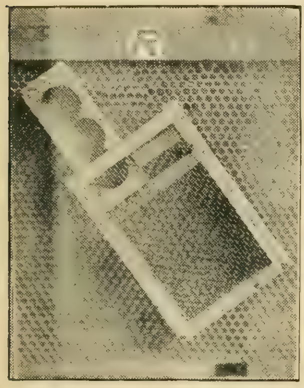
HOFFMAN & HAUCK, Inc. - - Woodhaven, New York

PATENTS Practice in Patent Office and Court. Patent Counsel of The A. I. Root Co.
Chas. J. Williamson, McLachlan Building,
WASHINGTON, D. C,

"Best" Hand Lantern

A powerful portable lamp, giving a 300 candle power pure white light. Just what the farmer, dairyman, stockman, etc. needs. Safe—Reliable—Economical—Absolutely Rain, Storm and Bug proof. Burns either gasoline or kerosene. Light in weight. **Agents wanted. Big Profits. Write for Catalog.**

THE BEST LIGHT CO.
306 E. 5th St., Canton, O.



SAFE-WAY QUEEN INTRODUCING CAGE

Cut shows cage in position on a section of a brood comb. Also shows mailing cage in position. Try it. It will do the business.

PRICE 50c.

O. S. REXFORD
Winsted, Ct.

THREE-BAND and GOLDEN QUEENS

That produce hustling bees. Bred to fill the supers from the finest breeding strains obtainable. Hustlers, long-lived, and as beautiful in size and color as can be. Price each, untested, $1.75; tested, $3.00. Orders filled promptly, satisfaction guaranteed. Ask for price on large orders.

DR. WHITE BEE COMPANY
SANDIA, TEXAS.

SPECIAL CROPS

$10,000.00 per acre every 5 years.

A high grade monthly devoted to growing MEDICINAL plants. $1.00 per year, sample copy ten cents.

HYBRID POTATO SEED. Something new. Every seed will give you new variety of potato. You will get all shapes and all colors. Some better than old standard sorts and some not as good. Package of this seed 25 cts. Potato seed and new subscription both for $1.00. Address

SPECIAL CROPS PUB. CO.
Box G, Skaneateles, N. Y.

QUEENS AND BEES

We have one of the most modern queen-rearing outfits in the United States, and are breeding from new imported Italian blood. We produce QUALITY instead of QUANTITY.

A limited number of orders for spring delivery will be accepted at the following prices:

Quantity	1	6	12	24
Untested	$2.00	$11.40	$21.60	$40.80
Sel. Untested..	2.25	12.80	24.30	45.90

Special price of $1.50 each on untested queens for June delivery in lots of 12 or more, if booked in advance.

We are also prepared to furnish full colonies, nuclei, and pound packages. Write today for prices.

The A. I. Root Co. of Texas
P. O. Box 765,
SAN ANTONIO, TEXAS.

Buy Your Bee Supplies Now

Take advantage of early-order discounts by ordering NOW. We guarantee to please you. "Prompt service and the very best" is our motto. *We want your beeswax and old comb.* Highest cash and trade prices offered. Texas beekeepers should write A. M. HUNT, Goldthwaite, Texas.

Manufactured by

Leahy Manufacturing Company
95 Sixth St., Higginsville, Missouri.
Write for FREE catalog. It is to your interest.

Established 1885.
Write us for catalog.

ALWAYS ON TOP

BEEKEEPERS' SUPPLIES

The Kind You Want and the Kind That Bees Need.

We have a good assortment in stock of bee supplies that are mostly needed in every apiary. The A. I. Root Co.'s brand. Let us hear from you; information given to all inquiries. Beeswax wanted for supplies or cash.

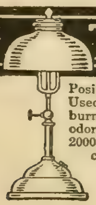
John Nebel & Son Supply Co.
High Hill, Montgomery Co., Mo.

When Stingers Can't Sting

Root's Bee-Proof Suit.

Bees can't sting thru this bee-proof suit, which is a combination of veil and specially designed blouse. It is comfortable, easy to put on and off, and provides perfect freedom for the movement of the arms. The draw-string is at the waist, and when properly drawn and tied shuts off any chance of a bee's getting inside. It gives absolute insurance against bee stings above the waist. Can be worn with or without a coat, and either inside or outside of a coat, if a coat is worn. For either men or women. Price, $5.00.

THE A. I. ROOT CO.,
West Side Sta., Medina, Ohio.



The "BEST" LIGHT

Positively the cheapest and strongest light on earth. Used in every country on the globe. Makes and burns its own gas. Casts no shadows. Clean and odorless. Absolutely safe. Over 200 styles. 100 to 2000 Candle Power. Fully Guaranteed. Write for catalog. AGENTS WANTED EVERYWHERE.

THE BEST LIGHT CO.
306 **E. 5th St., Canton, O.**

(Continued from page 310.)

on a mountain road for me to tell whether we are ascending or descending unless I get out and walk.

When we finally reached the summit overlooking the San Fernando Valley the view was so beautiful in the late afternoon sunshine that the memory makes my heart ache to think I live so far away from the mountains. Down, far, far below was the broad, fertile valley with its roads, fields, and villages and beyond a colorful mountain range, the whole softened by the purple haze of distance. In the foreground were fields of bright orange yellow, which they told me were fields of poppies.

One of the most wonderful features of driving in the vicinity of Los Angeles on a clear day is the way the snow-crowned San Bernardino range, with "Old Baldy," appears floating high above the blue haze of the horizon like phantom mountains. One can drive for hours in almost any direction and still keep in sight of "Old Baldy" if the day is clear; and yet it is some 40 miles from Los Angeles, I believe. It always reminds me of "I will lift up mine eyes unto the hills, from whence cometh my help."

Italian Queens
$2.00 each.
APIARIAN SUPPLIES
I. J. Stringham
Glen Cove, New York.

STUTT'S ITALIAN QUEENS

are supreme queens; ready June 1. Untested, $1.25; 6, $6.50; 12, $12.50. Select untested, $1.50; 6, $8.00; 12, $15.00. Pure mating and safe arrival guaranteed.

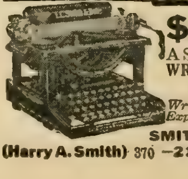
ALFRED A. STUTT, Lincoln, Ills.

INDIANOLA APIARY

will furnish 3-banded Italian bees and queens: Untested queens, $1.00 each; tested, $1.50 each. One pound bees, no queen, $2.00. No disease.

J.W.SHERMAN, VALDOSTA, GA.

TYPEWRITER SENSATION



$4 or $5 a month WILL BUY
A Standard, Guaranteed TYPEWRITER With Every Modern Writing Convenience
Write Today For Illustrated Circular Explaining Try-Before-You-Buy Plan
SMITH TYPEWRITER SALES CO
(Harry A. Smith) 370 **—218 No. Wells St., Chicago, Ill.**

NEWMAN'S ITALIAN QUEENS Bred From the Best. Absolutely First Quality and fully guaranteed. No disease. Satisfaction and safe arrival. Untested, $1.50; 6, $8.00; 12, $15.00. Select Untested, $2.00; 6, $10.00. 12, $19.00. Circular free.

A. H. NEWMAN, Queen Breeder

MORGAN, KY.

NEW ENGLAND

BEEKEEPERS will find a complete stock of up-to-date supplies here. Remember we are in the shipping center of New England. If you do not have a 1921 catalog send for one at once.

H. H. Jepson, 182 Friend St., Boston 14, Mass.

LARGE, HARDY, PROLIFIC QUEENS

Three-band Italians and Goldens, pure mating and safe arrival guaranteed. We ship only queens that are top-notchers in size, prolificness, and color. Untested, $2.00 each; six for $11.00; twenty-five for $45.00. Tested queens, $3.00 each, six for $16.00.

BUCKEYE BEE CO., Box 443, Massillon, Ohio.

World's Best Roofing at Factory Prices

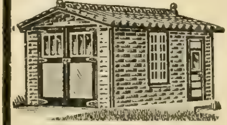
"Reo" Cluster Metal Shingles, V-Crimp, Corrugated, Standing Seam, Painted or Galvanized Roofings, Sidings, Wallboard, Paints, etc., direct to you at Rock-Bottom Factory Prices. Positively greatest offer ever made.

Edwards "Reo" Metal Shingles

cost less; outlast three ordinary roofs. No painting or repairs. Guaranteed rot, fire, rust, lightning proof.

Free Roofing Book

Get our wonderfully low prices and free samples. We sell direct to you and save you all in-between dealer's profits. Ask for Book No. 183



LOW PRICED GARAGES

Lowest prices on Ready-Made Fire-Proof Steel Garages. Set up any place. Send postal for Garage Book, showing styles.

THE EDWARDS MFG. CO.,
533-583 Pike St., Cincinnati, O.

FREE Samples & Roofing Book

MASON BEE SUPPLY COMPANY

MECHANIC FALLS, MAINE

From 1897 to 1921 the Northeastern Branch of The A. I. Root Company

Prompt and Efficient Service BECAUSE—Only Root's Goods are sold.
It is a business with us—not a side line.
Eight mails daily.
Two lines of railway.

If you have not received 1921 catalog send name at once.

BEE SUPPLIES

Root's Goods at Factory Prices
With Weber's Service

We carry several carloads of bee supplies, and are able to give prompt shipment at all times. Our motto is a customer must be satisfied; give us a trial and we will show you how quickly we will answer your correspondence; send your order and it will follow 24 hours after we receive it. Our new catalog will be ready about January 15th; send for same. We have thousands of satisfied customers; why not you? Send a list of your wants and we will quote you

C. H. W. Weber & Co.

2163-65-67 Central Ave., Cincinnati, Ohio.

Beekeeping as a Side Line.—Continued from p. 287.

their own hands. By bodily exercise they generate heat. By forming a close cluster they conserve it. The bees on the outside become a living wall, that confines the heat produced by those who, within this protected hollow, work faithfully and steadily, waving wings and moving legs and abdomens. The colder it gets, the harder they work, even to the point of making the temperature within the cluster rise as that outside falls. There is a constant interchange of position, the bees on the outside coming in, while those from within work their way out.

To allow this continued motion, there must be a constant consumption of energizing food. Few foods produce as much energy as the honey stored by the bees in summer for use in the winter. How wonderfully all the details co-ordinate!

Pure Italian Queens of the Best Known Strain

For immediate delivery of two-frame nuclei, two-pound packages and full colonies. A. I. Root and H. D. Murry three-banded stock.

Prices:	1	12
Untested	$1.50	$14.50
Tested	2.25	24.00
Select Tested	3.00	30.00

Two-frame nuclei with untested queens, $6.00; twenty-five or more, $5.50. Two-frame nuclei with tested queens, $6.75; twenty-five or more, $6.25. Two-pound packages hybrid bees, each $4.00; add price of queens wanted.
No disease near here; health certificate with all I have for sale. Safe arrival and satisfaction guaranteed. Terms: One-fourth with order; balance due at shipping time.

Baughn Stone
Manchester, Texas.

QUEENS

Now for May and June. Good crops and good queens go together.
GENTLE THREE-BAND ITALIANS
Untested $1.25, Select Untested $1.50.

D. W. HOWELL
Shellman, Ga.

THE OLD RELIABLE
THREE-BANDED ITALIANS

Booking orders now for 1921. Queens ready April 1st. My Italians are of an exceptionally vigorous and long-lived stock strain of bees. They are gentle, prolific, very resistant to foul brood, and the best of honey-gatherers. I have sold a good many queens to parties who are using them in stamping out foul brood. Orders booked for one-fourth cash, balance before delivery. Will guarantee safe arrival in the United States and Canada. Descriptive circular and price list free.

	Prices April, May, and June			July to November		
	1	6	12	1	6	12
Untested	$1.50	$8.00	$15.00	$1.25	$6.50	$12.50
Select Untested	1.75	9.00	16.00	1.50	8.00	15.00
Tested	2.50	12.50	24.00	2.25	12.00	22.00
Select Tested	3.00 each			3.00 each		

No nuclei or pound packages of bees for sale.

John G. Miller, 723 C St., Corpus Christi, Tex.

BANKING BY MAIL AT 4%

YOUR CHANCE IN LIFE

is of your own making rather than of your taking. Your Savings Account may—WILL—be the making of your chance. MAIL your Savings deposits to this institution.

THE SAVINGS DEPOSIT BANK CO.
A. T. SPITZER, Pres.
E. R. ROOT, Vice Pres. E. B. SPITZER, Cash.
MEDINA, OHIO

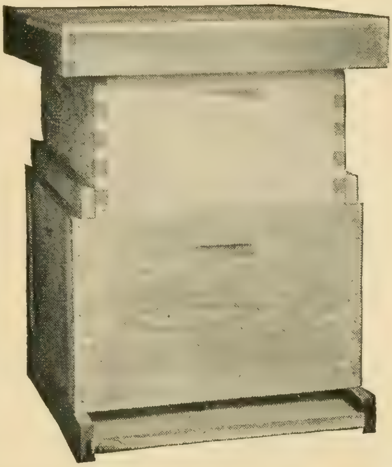
Modified Dadant Hive

Your present brood equipment can be put above the Modified Dadant hive used as full depth supers.

Features are: Deep frames, large one-story brood nest, frame space ventilation, excellence in wintering, swarming easily controlled.

Glance at this illustration to compare this hive with "Standard" Langstroth hive.

You can get 40 per cent greater brood-comb area than in the "Standard" ten-frame Langstroth.



Modified Dadant Hive Features.

1. Eleven frames, Langstroth length, Quinby depth.

2. Frames spaced 1½ inches for swarm control.

3. Extracting frames 6¼ inches deep.

4. Dovetailed body, regular reversible bottom and metal roof cover with inner cover.

5. Langstroth "Standard" equipment easily used with this hive.

For free booklet write any distributor of Lewis "Beeware," or to

G. B. Lewis Company - - - - - - - Watertown, Wisconsin
Dadant & Sons - - - - - - - - - - - Hamilton, Illinois

PACKAGE BEES

Have you winter losses to make up or are you thinking of making increase? If so, have you considered package bees? Their advantages are many:

1. You always have a young and vigorous Italian queen.
2. Pure Italians; no disagreeable black bees to handle.
3. Freedom from disease. You take no chance of infecting your apiary with foul brood in buying package bees from us.
4. You furnish your own equipment; it is therefore interchangeable with your present equipment. Every beekeeper knows the annoyance of fooling with odd-sized hives and frames and crossed or drone comb in colonies bought locally.
5. They can be made to pay for themselves in a single season and have a good colony left, even with honey at pre-war prices. (H. D. McIntyre, Durham, Ont., Can., writes: "The 96 2-lb. packages received from you late in May average 160 pounds of surplus.")
6. You do not weaken your present colonies, as is the case with artificial or natural swarming, thereby sacrificing your honey crop.

If you have tried package bees from other shippers with unsatisfactory results now try ours; safe arrival in the U. S. and Canada, and satisfaction guaranteed. Absolute freedom from disease. We are now prepared to ship all orders promptly.

PRICES

1 2-lb. package (add 75c for parcel post)	$5.00
50 2-lb. packages, or more, ea.	4.75
1 Untested Queen	1.50
12 Untested Queens	15.00
1 Select Untested Queen	2.00
12 Select Untested Queens	19.00
1 Tested Queen	2.50
12 Tested Queens	25.00
1 Select Tested Queen	3.00
12 Select Tested Queens	30.00

J. M. CUTTS, Route 1, Montgomery, Alabama

Northwestern Headquarters for Italian Queens

The queen is the life of the colony. You cannot afford to keep poor queens or a poor strain of bees. I have been in the bee business for more than twenty years and have made every effort to improve the honey-gathering qualities of my bees by purchase of breeders and by selective breeding. I believe that my bees are unsurpassed by any. When you buy Untested Queens from me you are getting select untested queens. I will begin mailing queens about June 1.

Prices June 1 to October 1:	1	6	12	50	100
Untested Italian Queen	$1.50	$7.50	$14.00	$55.00	$105.00
Tested Italian Queen	2.50	13.50			

I have no pound packages or nuclei for sale.

J. D. HARRAH, Route 1, Freewater, Oregon

TALKING QUEENS

LAW'S QUEENS SPEAK FOR THEMSELVES

Untested, each	$1.50;	12 for $15.00
Tested, each	$2.00;	12 for $20.00
Select Tested,	$3.50 each;	12 for $30.00

Some very fine Breeding Queens too good to be idle. Will mail at $5.00 each, or with a 3-frame nucleus by express for $10.00. Write for prices on bees. Safe arrival and entire satisfaction.

W. H. LAWS, Beeville, Texas

Colonies of Italian Bees

in practically new 10-frame hives, at $15.00 each. No disease. These colonies will consist of at least 5 frames of brood, plenty of bees, with young Italian queens. All combs are wired, straight, and built from full sheets of foundation. Satisfaction guaranteed.

VAN WYNGARDEN BROS.

R. F. D. No. 4. Hebron, Indiana.

ITALIAN BEES & QUEENS OF PURE THREE-BAND STOCK

Bred from best hustlers, by methods that years of experience have taught us are best, including the use of large, strong nuclei, which insures young queens emerging strong and vigorous. Safe arival in U. S. and Canada. Health certificate with each shipment. Satisfaction guaranteed.

Untested	1 to 12, $1.50 each.	Over 12, $1.25 each
Select Untested	1 to 12, $1.75 each.	Over 12, $1.50 each
Tested	1 to 12, $2.50 each.	Over 12, $2.25 each
Select Tested, suitable for breeders		$5.00 each

Two-frame nuclei, $5.00. Three-frame nuclei, $7.00; add price of queen wanted with each. Eight-frame colony, $15.00. Ten-frame colony, $17.50. Standard equipment all around, and wired frames.

JENSEN'S APIARIES, CRAWFORD, MISS., R. F. D. No. 3.

The Bees as Buyers

IF BEES could choose the wares required to do their work best, chances are they'd select "Falcon" supplies, to keep them contented and help them produce more honey.

Because "Falcon" stands for 40 years' satisfaction among successful beekeepers and their colonies.

Our guarantee of safe arrival follows every article shipped from our factory. **Order the best—write for our red catalog.**

DISTRIBUTOR FOR THE CENTRAL WEST
William H. Rodman, 2027 Main St., Gateway Sta., Kansas City, Mo.

W. T. Falconer Manufacturing Co.

Falconer (near Jamestown), N. Y., U. S. A.
Where the best beehives come from.

SELECT THREE-BANDED ITALIANS OF THE HIGHEST QUALITY ONE GRADE

800 honey-gathering colonies from which to select the very best breeders. No one has better bees than I. Can make prompt delivery by return mail. I have not yet disappointed a customer.

PRICES: Untested (to July 1): each $1.50; 12 or more $1.25 each. After July 1, 1 to 49 $1.25 each, 50 or more, $1.00 each. Tested (to July 1), each $2.00. Breeders (to July 1), $25.00 each.

Pure mating, safe arrival, and satisfaction guaranteed. It is left with customer to say what is satisfaction.

A new customer from Missouri, where you have to show them writes: "The dozen queens arrived promptly. They are the most beautiful I ever saw."—(Name on request.)

Another one from the same state writes: "Your 100 2-lb. packages averaged 90 pounds surplus honey per colony, 10 pounds more per colony than the other 2-lb. packages purchased elsewhere."—H. H. Thale, Durham, Mo.

Now listen to this, from Ontario, Canada: "Bees and queens purchased of you last season all wintered without a single loss. Save me 50 untested queens for May delivery."—(name on request.)

My customers say my queens stand the northern winters. They are bred up for this, combined with the highest honey-gathering qualities and prolificness.

JASPER KNIGHT, Hayneville, Ala.

BEE SUPPLIES The Very Best Quality & Service

We have a large stock of Hives, Bodies, Supers, Foundation, and other supplies ready for immediate shipment.

Give us an opportunity to quote you our prices; we are certain you will find them attractive.

If you want THE VERY BEST QUALITY FOR THE LOWEST PRICE, send us your orders at once. All correspondence will have our immediate attention.

August Lotz Company, Boyd, Wis.

Completely Destroys the Weed Growth

More than that, the BARKER breaks the hardest crust into a level, porous, moisture-retaining mulch—**all in the same operation.**

A ten-year-old boy can run it—do more and better work than ten men with hoes. Saves time and labor, the two big expense items.

BARKER WEEDER, MULCHER AND CULTIVATOR

Eight reel blades revolve against a stationary underground knife — like a lawn mower. **Best Weed Killer Ever Used."** Works right up to plants. Cuts runners. Aerates the soil. Has leaf guards, and shovels for deeper cultivation—3 *garden tools in* 1.

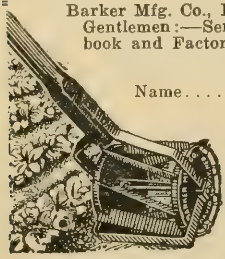
FREE ILLUSTRATED BOOK.

Tells how gardeners and fruit-growers everywhere are reducing their work; increasing their yields.—How to bring growing plants through a dry season.—How to conserve the moisture and force a larger, more rapid growth. Send TODAY for this free, illustrated book and special Factory-to-User offer.

BARKER MANUFACTURING COMPANY

Dept. 23. David City, Neb

Barker Mfg. Co., Dept. 23, David City, Neb.
Gentlemen:—Send me postpaid your free book and Factory-to-User offer.



Name........................

Town ....

State ....

R. F. D. or Box........

Two Thousand Nuclei For Spring Delivery

A great many progressive beekeepers of today buy nuclei to make up winter losses, or in the form of pound packages to strengthen weak colonies. We know this is a good investment, and for a good many years have raised bees in the South, sending them north to catch the honey flow in July and August. It is our policy, in furnishing our customers with bees from our southern apiaries, to furnish bees that give satisfaction to you, as they have to us for the past ten years. We are very particular as to the strain of bees we keep, and the rearing of our queens is in the hands of an expert.

We maintain that the queen is the life of the colony, and they are reared under the most favorable conditions, that of natural swarming, and they are fine large ones with energy to spare, and as good as money can buy. However, we do not sell queens, but we see that a good queen goes with every nucleus we sell. We guarantee you safety against disease, as our bees are inspected constantly, and our apiaries closely watched to see that no disease appears. Our prices as follows:

	April	May	June
1-frame nucleus	$4.00	$3.50	$3.00
2-frame nucleus	5.50	5.00	4.50
3-frame nucleus	7.00	6.50	6.00
4-frame nucleus	9.00	8.50	8.00

Full colonies of bees, $12.00 per colony

1-pound package	$2.50
2-pound package	4.50
3-pound package	6.50

For packages with queens add $1.50 for each package.

WEBER BROS. HONEY CO.
RIALTO, CALIFORNIA

Quality Bee Supplies From a Reliable House

¶ Without fear or favor I place my BEE SUPPLIES and SERVICE before you.

¶ It is the small annoyances that often grow into disastrous results. Avoid the so-called "little losses" by using MONDENG'S goods. Quality is first—save time when you put your goods together by getting supplies that are accurately made. Service is next—no delays when bee supplies are ordered from my factory.

¶ I am ready to meet your urgent needs. Send for my latest price-list.

¶ Closing out all Langstroth and Wisconsin hives and supers. Also Langtroth triangular top-bar frames, and eight-frame D. T. supers for 4 x 5 sections. At cost price, write for quotations.

Charles Mondeng

146 Newton Ave. N. &
159 Cedar Lake Road.
MINNEAPOLIS, MINNESOTA.

Beeswax Wanted

In big and small shipments, to keep Buck's Weed-process foundation factory going. We have greatly increased the capacity of our plant. We are paying higher prices than ever for wax. We work wax for cash or on shares.

Root Bee Supplies

Big stock, wholesale and retail. Big catalog free.

Carl F. Buck

The Comb-foundation Specialist

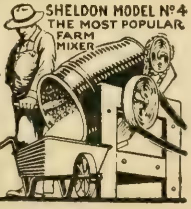
August, Kansas

Established 1899.

FARM
CONCRETE
BOOK

FREE Book on Concreting

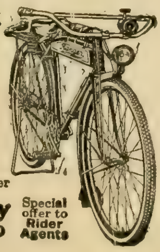
Sheldon's free book gives you the "Know How" of Farm Concreting. Tells how to make forms, place concrete, reinforce it, what mixtures to use and how to prevent failures. Gives necessary facts on construction of walls, tanks, floors, etc., giving diagrams and plans. Brimful of valuable ideas. Gives you **Free** the benefit of our years of experience in farm concreting. Get copy today; send your name and address.



SHELDON CONCRETE MIXERS

"Take the Backache Out of Concrete" with the best and lowest priced farm concreting outfit on the market. Saves time, money and labor. Don't buy till you have seen Sheldon Catalog and prices. Send for Catalog and **Free** Concrete Book today.

SHELDON MANUFACTURING CO.
459 **Main Street. Nehawka, Neb.**



30 Days' Free Trial Select from **44 Styles**, colors and sizes, famous **Ranger** bicycles. **Delivered free on approval**, from maker - direct - to - rider, at **Factory Prices**. Save $10 to $25 on your bicycle.

12 Months to Pay Immediate possession on our liberal Easy Payment plan. Parents often advance first deposit. Energetic boys earn the small monthly payments thereafter.

Tires Horns, wheels, lamps, parts and equipment at half usual prices.

SEND NO MONEY—Ask for big free Ranger Catalog, marvelous prices and terms.

Mead Cycle Company
Dept. G153 **Chicago**

Special offer to Rider Agents

EVERY SHEET THE SAME

As alike as peas in a pod—only more so. That is a distinguishing feature of my comb foundation. Accuracy is my watchword. My foundation is not left with the natural milled edge, but every edge is trimmed with an absolutely straight, smooth cut, and always measures right to the dot, no matter what the size ordered.

This accurate trimming not only expedites placing the foundation in the frames, but also permits of such close packing for shipment that there is no chance for it to chuck around, thus jamming the edges.

Although this extra trimming adds to the cost of manufacture, still my prices are lower than others.

Your own wax worked into foundation at lowest rates. Send for complete price list.

E. S. Robinson

Mayville, Chautauqua Co., N. Y.

Queens & Bees

Mr. Beekeeper, we are establishing one of the most modern queen-rearing outfits in the U. S. A. If you want good quality, quick service, prompt attention, and perfect satisfaction, don't fail to place your orders with us, as we are ready to fill orders by return mail or your money refunded. Our queens are bred by experienced queen-breeders; they are reared by the latest and most approved method and from the very best honey-gathering strain of Italians obtainable. Our experience from boyhood up under our father (who had fifty years of experience with bees) thus enables us to produce queens as good as can be produced, but none better, and we sell at figures that will sustain the high quality of our queens. Our bees are hardy, gentle, prolific, disease-resistant, and honey gatherers. Each and every queen that leaves our yard is inspected by us personally, and all inferior ones are killed.

BEES.

We ship only 2-lb. packages by express F. O. B. shipping point, $5.00 each; 25 or more, $4.75 each. Add prices of queens wanted. We guarantee pure mating, safe arrival, and free from all diseases in U. S. A. and Canada. Remember you take no risk when you deal with us. Isn't that enough said?

PRICES MAY AND JUNE.

	1	6	12	100
Untested Queens......	$1.50	$8.00	$15.00	$100.00
Select Untested Queens	1.75	9.25	16.50	115.00
Tested Queens	2.75	13.75	24.50	
Select Tested Queens..	3.50 each			

THE NORMAN BROS. APIARIES

NAFTEL, ALABAMA

Forehand's Queens

They Satisfy---Why?

Because of 28 years of experimental work, with both queen-breeding and honey-production. With breeding and selecting of imported queens, I have reached a standard which is ideal. Queens as good, but none BETTER. Why experiment? Take advantage of the life experience of my breeders.

OUR SERVICE STATION—We are ready to serve you at all times, whether you desire queens or advice. Let us help you with your bee problems. All questions are cheerfully answered.

I breed three-banded Italians only. Nov. 1st to June 1st.

	1	6	12
Untested	$2.00	$ 9.00	$16.00
Selected Untested	2.25	10.50	18.00
Tested	3.00	16.50	30.00
Selected Tested	3.50	19.50	36.00

Bees in two-pound packages, 1 package, $6.00; 25 or over, $5.80; 50 or over $5.40; 100 or over, $5.00, without queens. Will begin shipping bees as early as weather will permit.

Orders booked now for spring delivery. One-fourth the full amount with order and balance when shipment is desired. Pure mating, safe arrival, and perfect satisfaction guaranteed. Write for circulars and large-order discounts. Foreign orders at receiver's risk.

N. Forehand, Ramer, Alabama

BUYING BEES IS LIKE BUYING OTHER STOCK

An important consideration in the purchase of bees or queens is to get **HARDY, VIGOROUS STOCK.** Our own bees have wintered without the loss of a single colony, and today our colonies are active and strong. We were never in better position to make prompt shipments nor to supply our customers with the highest-grade stock, than we are today. It is with bees as with any other stock, if you want something really fine it naturally will cost a little more than ordinary stock, but the results may be many times better for the investment made.

ITALIAN QUEENS.—The season is early here in Medina, and untested queens will be available earlier than usual. Our breeding queens are selected with the utmost care, and the reputation of Root's queens is second to none. The large orders that we have received from near and distant points is the best testimony on this point. Our basswood queen-breeding yard will be supplemented by our Maplewood and other yards as occasion requires, under the management of Messrs. Deyell, Mell Pritchard, Mosgrove, and Wardell.

NUCLEI.—A one, two or three frame nucleus will make an astonishing record provided such a nucleus goes out, as ours do, on full worker combs in wired frames, well supplied with bees and the proper amount of brood. We do not wish to draw any comparisons in reference to our nuclei or colonies with those supplied from other sources, but the large number of reports from hundreds of satisfied customers warrant us in believing that the extreme care we take in breeding and putting up our nuclei and in the selection of our combs is of decided advantage to our customers.

BREEDING QUEENS.—As our stock of breeding queens this spring is rather limited, it is important that orders be placed promptly for those who desire to introduce our breeding stock for 1921 use. We wish to call attention also to the fact that we are this season testing a limited number of queens for 1922 delivery of pedigreed stock, and we urge those who are expecting to replace their breeders late the coming fall or next spring to place their orders with us early this summer so that we can arrange to give them just what they want. Our prices for the pedigreed stock will run from $25 to $100 each.

QUANTITY ORDERS.—We refer to our catalog for prices on queens, nuclei, and colonies and urge buyers to write us immediately for quantity prices from a half dozen to 100 or more, stating delivery wanted and we will quote special prices on the same.

THE A. I. ROOT COMPANY

WEST SIDE STATION, MEDINA, OHIO, U. S. A.

Root Quality Bee Supplies

Airco Foundation

Prompt Service and Satisfaction Guaranteed.

Order Now!
Bee Ready!

BEGINNER'S
OUTFITS
A SPECIALTY

Stock Up!
Avoid the Rush!

DISCOUNT ON LARGE ORDERS.

Pure-Bred Italian Queens

From Root Home-Bred Queens

Orders filled in rotation unless date specified. Mating and Safe Arrival Guaranteed. Bees in Packages, Nuclei and Full Colonies.

QUEENS

Untested	$1.50 each	12 or more, $1.25 each
Tested	2.50 each	12 or more, 2.25 each
Select Tested	3.00 each	12 or more, 2.75 each

PACKAGES

1-lb. pkgs., no queen	$3.00 each	25 or more, $2.75 each
2-lb. pkgs., no queen	5.00 each	25 or more, 4.75 each
3-lb. pkgs., no queen	7.00 each	25 or more, 6.50 each

NUCLEI

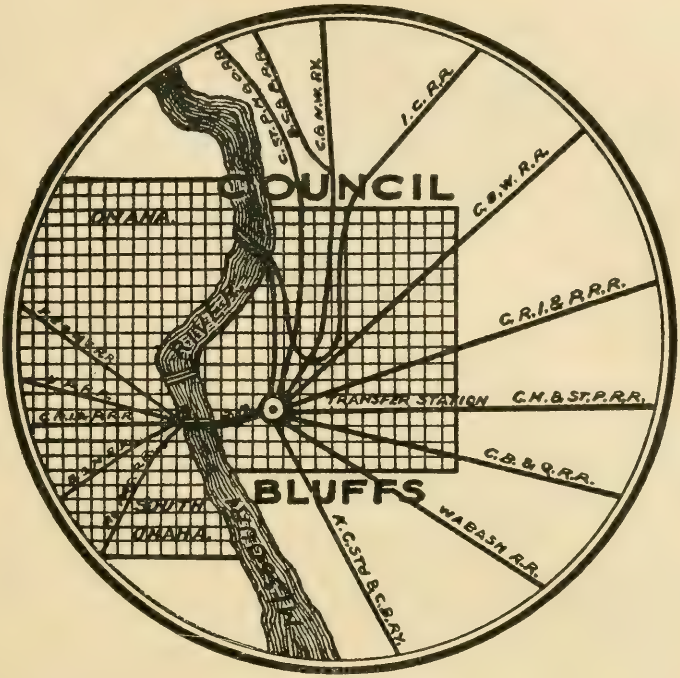
Two-frame Nucleus, no queen	$4.50
Three-frame Nucleus, no queen	6.00

FULL COLONIES

Eight-frame colony, no queen	18.00
Ten-frame colony, no queen	20.00

The Southland Apiaries

W. S. TATUM, Prop. HATTIESBURG, MISS.


COUNCIL
BLUFFS
OMAHA
SOUTH OMAHA
RIVER
MISSOURI
C. St. P. M. & O. R.R.
C. G. W. R.R.
C. & N. W. RY.
I. C. R.R.
C. G. W. R.R.
C. R. I. & P. R.R.
TRANSFER STATION
C. M. & ST. P. R.R.
C. B. & Q. R.R.
WABASH R.R.
K. C. St. J. & C. B. RY.
C. R. I. & P. R.R.

ONE REASON WHY we can serve Western Beekeepers to their advantage is because nine trunk lines run from our siding into all parts of the West! That's why we can get supplies to you promptly, and at a saving in freight charges and valuable time. When you are in a hurry, call on us. That is, if you want quality goods; for that is the only kind we can send you.

The A. I. Root Company of Iowa
Council Bluffs, Iowa

Cypress Hives

Quality

FULL 7/8 INCH THICK

Wood Eternal

Economy

$16.00 for five complete. Send for catalog.

SPECIALS FOR THIS MONTH.

Now is your chance to get rid of all inferior covers and replace them with the best wood cover made at a bargain.. Eight-frame one-piece covers in lots of 25 at the low price of 60c each. Special discount on Hoffman frames in lots of 500 to 10,000.

ITALIAN BEES AND QUEENS.

Three-banded **ITALIAN QUEENS** reared from the best mothers under favorable conditions, by careful breeders under the best known methods. **GUARANTEED TO BE AS GOOD AS THE BEST, TO BE FREE OF DISEASE AND TO GIVE SATISFACTION.**

Untested, $2.00; 12 or more, $1.50 each. Tested, $3.00 each.

Breeders, $10.00, $15.00, and $25.00 each, shipped in nuclei.

Full colonies in eight-frame hive	$20.00
Full colonies in ten-frame hive	22.00

NUCLEI.

All our nuclei are furnished on good combs well filled with brood and a good supply of young bees.

One-frame nucleus, no queen	$3.50
Two-frame nucleus, no queen	6.00
Three-frame nucleus, no queen	8.25

BEES.

Special price on nuclei and pound packages for shipment after May 15th, in lots of 20 or more packages. Write us.

A FULL LINE OF ROOT'S GOODS AT ROOT PRICES.

Hives, Frames, Foundation, Supers, Sections, Shipping Cases, ready to ship to you promptly. Let us quote you on large orders.

PACKAGE BEES.

We guarantee safe arrival of all package bees within six days of shipping point.

One-pound package bees, no queen	$3.50 each
Two-pound package bees, no queen	6.00 each

Safe arrival and satisfaction guaranteed on everything we sell. Nuclei and pound packages shipped either from Mayhew, Miss., or Helena, Ga.

THE STOVER APIARIES

Mayhew, Mississippi

You have put off ordering until now. You must have some supplies right away. Let us help you out. We give SERVICE.

Try us for prompt shipments. By MAIL, EXPRESS or FREIGHT. Send in your order, large or small.

Don't Let the May-Bees Get You
Order Now and Make Sure

of having your supplies ready on time. If you want that crop of honey do your part, and the bees will do theirs.

F. A. Salisbury
1631 West Genesee Street
SYRACUSE, N. Y.

New York State Beekeepers, Send for our catalog.

If you are looking for quality, try us. Let us have your order for smokers, tools, and whatever else you may need.

Write for our catalog. Send us a list of your needs. We will gladly quote you.

THE AULT 1921 BEE SHIPPING CAGE

Patent Pending

1st. It is a dark cage, much more so than the open screen cages we have been shipping in in the past.

2nd. The feeder uses pure sugar syrup. Better than Honey or Candy to ship on; it contains water as well as feed.

3rd. Feeders are made more substantial, 1-3 larger, and have screw cap that will not jar out.

4th. Instead of one small hole, we now use a cotton duck washer in the screw cap that has proven to overcome all the objections found to the liquid feed method.

5th. The Cage is one piece screen wire protected by thin boards on the outside. Send for free circular describing the cage in detail, prices, etc.

Queens—Package Bees—Queens

Will book your order with 20 per cent down, balance just before shipping. My Free Circular gives prices in detail, etc. Safe delivery Guaranteed within 6 days of shipping point. We ship thousands of pounds all over U. S. A. and Canada.

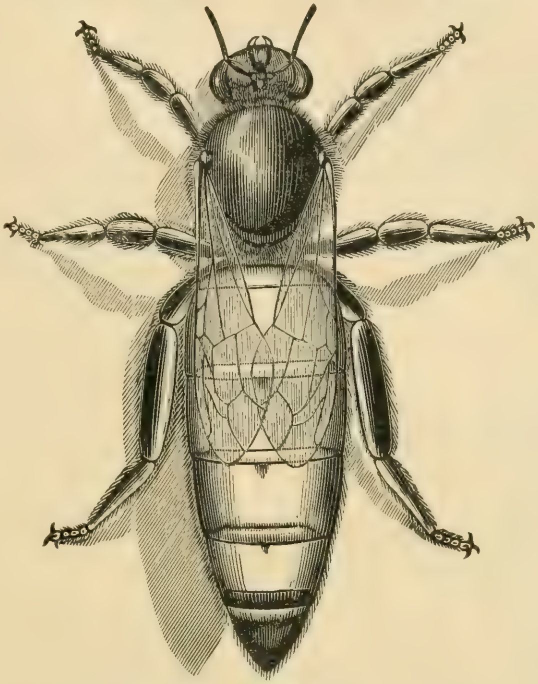
1-pound package bees, $3.00 each, 25 or more $2.85 each.
2-pound package bees, $5.00 each, 25 or more $4.75 each.
3-pound package bees, $7.00 each, 25 or more $6.65 each.
F. O. B. Shipping Point. Add price of queen wanted.

1 Untested Queen, $2.00 each; 25 or more, $1.75 each
1 Select Unt. Queen, $2.25 each; 25 or more, $2.00 each
1 Tested Queen, $3.00 each; 25 or more, $2.70 each
1 Select Tested, $3.50 each; 25 or more, $3.00 each

Nueces County Apiaries

E. B. AULT, Prop. --::-- Calallen, Texas

"*Queens that are reared to please.*"



Highest Quality---Prompt Service---Satisfaction

Our Reliable Three-Banded Italian Queens

will be ready by return mail promptly after April 5th. We will have 1500 Nuclei in full operation and can take care of orders by return mail. All orders filled promptly by return mail or money refunded. Requeen your colonies early.

Why Order Farmer Queens?

They are bred by as skillful and experienced queen-breeders as can be found in the United States. There are very few places where queens are reared under as favorable conditions as in our queen-rearing yards. We devote our time to rearing as good queens as possibly can be, and we positively guarantee that no better can be reared; we spare neither labor nor money in developing our strain of Italians. It is our intention to improve our original stock each year and to be more skillful queen-breeders. Our first original stock was procured from the highest quality obtainable, which we have proved to the highest point and is now not surpassed by any. Our own eyes inspect every queen that leaves our yards; no culls sents out. Place your orders, and after you have given our queens a fair test and you are not satisfied in every way that they are as good as any you have ever used, just return them and we will send you queens to take their places or return your money. They are very resistant to diseases, the very best for honey-gathering. You take no risk in buying our queens; safe arrival in U.S.A. and Canada; satisfaction is left entirely to purchaser; prompt service given to all orders; every queen guaranteed to be purely mated.

OUR PRICES

	1	6	12	100
Untested	$1.50	$8.00	$15.00	$100.00
Select Untested	1.75	9.50	17.00	120.00
Tested	3.00	14.75	25.00	
Select Tested.	4.00	23.00	42.00	

Write for prices on larger quantities than 100.

The Farmer Apiaries, Ramer Alabama

Where the Good Queens Come From.

A GOOD QUEEN

may bring you $50.00 worth of honey, while a poor one may bring you nothing, therefore the cost of a good queen is trifling compared with the returns she brings. Every queen we send out is reared by me personally, and I spare no labor or expense to produce those "good queens" we all desire. I give the strongest guarantee with all queens sent out, and if any should prove other than a first-class queen, I will gladly replace her upon request. The customer's word is good. I could not afford to do this, if I did not have faith in the queens I sell.

They clean up European Foul Brood.

"Your bees last year made me the biggest crop I ever had, and besides they cured the European Foul Brood I had while I lost all my black bees with it."—Martin Bettheuiser, Tunnel City, Wis.

They Are Good Honey Getters.

"Your queens proved themselves to be what their producer claimed, 'fine gatherers.' "—E. A. Palmer, Empire, Panama Canal Zone.

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"Your bees are very gentle. I also find them to be very prolific, good workers and, in my 12-frame Jumbo hives, not given to swarming."—Harry G. Fesenfeld, Black Earth, Wis.

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"The breeder I got from you last year is the finest queen I ever had."—John Rhodes, West Salem, Wis.

Our Method of Shipping Gives Perfect Results.

"Queens arrived in perfect condition, not a single nurse bee dead in the cage."—Arthur Sturges, Shenstone, Hartford, Cheshire, England.

1921 PRICES.

1 to 4 inclus.,	$3.00 each
5 to 9 inclus.	$2.90 each
10 or more,	$2.80 each
Breeders	$12.00 each

We are usually booked some time in advance, so we suggest that you book your order as far in advance as possible in order not to be disappointed in getting your order filled when desired. Write for our catalog.

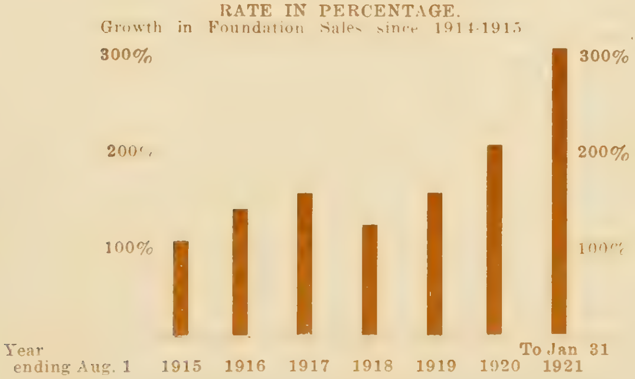
JAY SMITH

Route No. 3 Vincennes, Indiana

A GREAT RECORD

Sales
of
Airco Comb Foundation

from Medina showed an increase of 49½% during the six months ending December 31, 1920, as compared with the same period for 1919. The record for the same period in 1919 had beaten all former records by practically the same percentage.



A record to be proud of—one which shows that beekeepers appreciate real values.

Use Airco Foundation this Season, then be your own judge of its merits.

For your convenience, prompt service, and saving on carriers' charges you can address The A. I. Root Co., at any of the following points where Airco Foundation is always in stock:

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Indianapolis, 873 Massachusetts Ave.
Council Bluffs, Iowa.
San Antonio, P. O. Box 765.
Los Angeles, 1824 E. 15th St.

San Francisco, 52-54 Main St.
New Orleans, 224 Poydras St.
New York, 23 Leonard St.
Philadelphia, 8-10 Vine St.
Norfolk, 10 Commerce St.
Syracuse, 1631 W. Genesee St.

THE A. I. ROOT COMPANY, Medina, Ohio

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Pushing straight across the continent with the pioneers for 47 years, these lines mark some of the cities where Lewis now makes "Beeware" available to you in quantities.

Dependable in workmanship as the jeweled watch—checked for quality by workmen grown old in the service — this superiority makes "Beeware" worth more than it costs.

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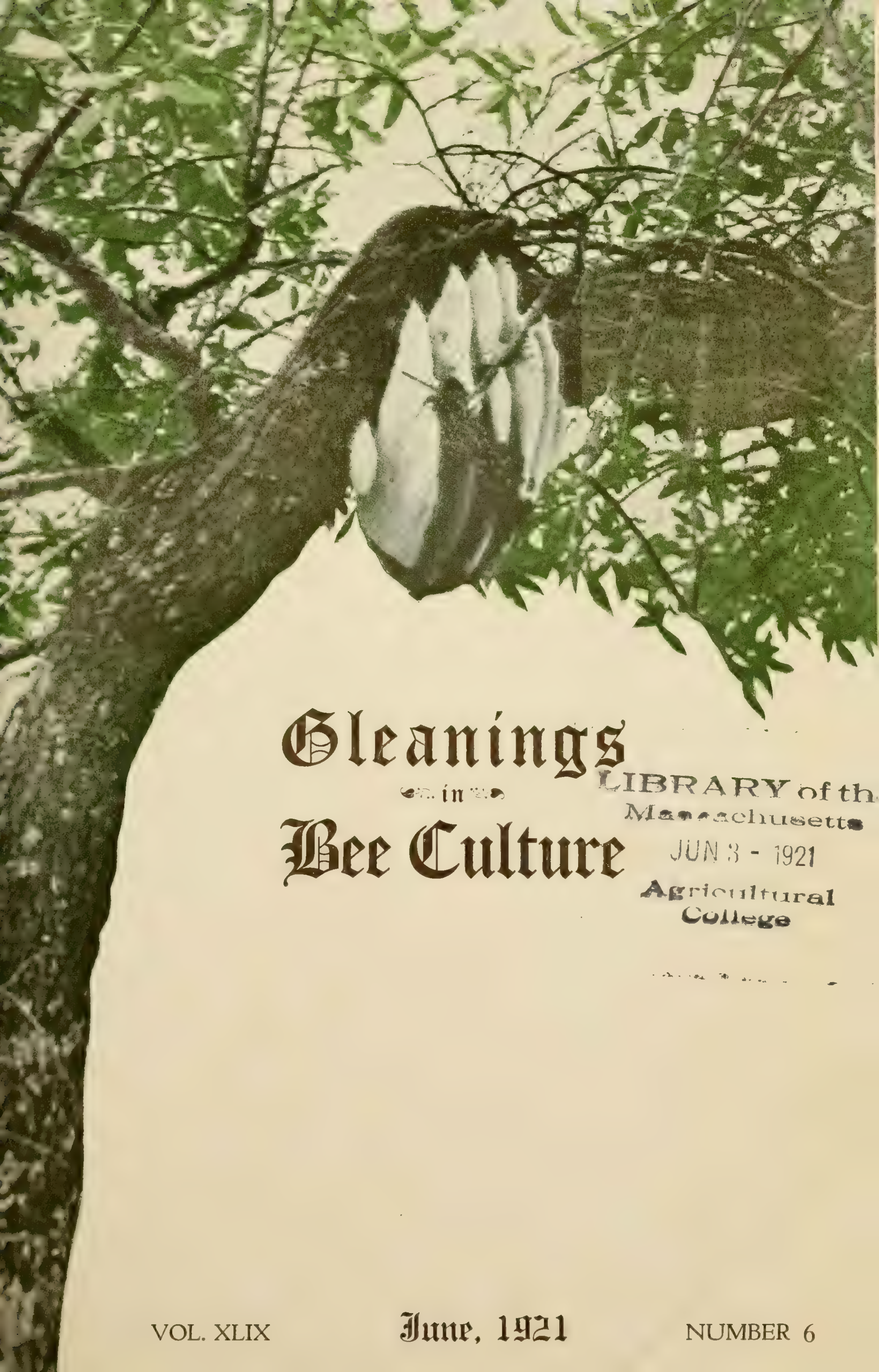

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VOL. XLIX June, 1921 NUMBER 6

You all know the value of good Queens. When buying why not buy the **BEST**. Our Queen-rearing Apiary, in charge of Henry Perkins, will be able to supply the "Best" Queens obtainable shortly after April 1st.

Send in your order at once to avoid delay in securing your requirements. Prices very attractive. Satisfaction guaranteed.

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"Griggs Saves You Freight"

TOLEDO

Is yet the same good old place to send that Bee Supply order, and if you order without our catalog and special price list of Queens, Live Bees and **Griggs Non-Robbing Bottom-Board**, Hive-Stand and Feeder Combined, we both lose money.

A Full Line of ROOT QUALITY GOODS carried at all times.

Service is our Hobby, and Satisfaction Guaranteed.

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The Old Reliable Three-Banded Italians

Booking orders now for 1921. Queens ready April 1st. My Italians are of an exceptionally vigorous and long-lived stock strain of bees. They are gentle, prolific, very resistant to foul brood, and the best of honey-gatherers. I have sold a good many queens to parties who are using them in stamping out foul brood. Orders booked for one-fourth cash, balance before delivery. Will guarantee safe arrival in the United States and Canada. Descriptive circular and price list free.

	Prices April, May, and June			July to November		
	1	6	12	1	6	12
Untested	$1.50	$8.00	$15.00	$1.25	$6.50	$12.50
Select Untested.	1.75	9.00	16.00	1.50	8.00	15.00
Tested	2.50	12.50	24.00	2.25	12.00	22.00
Select Tested ..	3.00 each			$3.00 each		

No nuclei or pound packages of bees for sale.

JOHN G. MILLER
723 C Street
Corpus Christi, Texas

SAVE YOUR BEES' TIME

USE AIRCO FOUNDATION—The only comb foundation on the market which has cell base most closely resembling that in the natural comb. The bees do not have to make over the cell base, therefore Airco saves time which is valuable, especially during a heavy honey flow.

AIRCO FOUNDATION is milled from wax refined by a new process which insures a tougher and more transparent product without the use of acid or injurious chemicals.

NOTE. Airco Foundation is absolutely the only foundation on the market which is made from these new process mills with corrected cell base.

THE A. I. ROOT COMPANY OF CALIFORNIA

Los Angeles: 1824 E. 15th Street San Francisco: 52-54 Main Street.

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Editorial Staff

Geo. S. Demuth and E. R. Root, Editors
A. I. Root, Editor Home Dept.
Iona Fowls, Assistant Editor
H. G. Rowe, M'n'g Editor

This is a **MUTH IDEAL VEIL.** $1.50 will bring this veil to you direct from us or any G. B. Lewis distributer.

Do you know this fellow? I can't say anything nice about him here—he wouldn't like it. Funny smile, isn't it? The photographer's not to blame either because it's just ME—Clif. Muth.

¶ Have you been stung much this year? So have I, but I mean by bees. If you had an "IDEAL BEE VEIL" you could smile too (if the Photographer told you to). Really, they're good; get one.

¶ Did you get a list of our special quotations on supplies? There's a saving from 20 to 25c on your dollar when you buy from us.

¶ Got any honey you want to sell?

¶ We render wax from your old comb. Send for shipping tags.

¶ Need any good queens? Dandies, $2.00, six for $10.50.

¶ By the way, that's a good veil.

THE FRED W. MUTH CO.
Pearl and Walnut Cincinnati, Ohio

"SUPERIOR" FOUNDATION

Yes, we are ready for the rush. Many tons now ready for shipment, and our machines are running to utmost capacity. Use the best. If your dealer can't supply you, write us for price, stating quantity required. We also accept beeswax for foundation or supplies.

"Everything in Bee Supplies"

SUPERIOR HONEY COMPANY
OGDEN, UTAH.
(Manufacturers of Weed Process Foundation)

Indianapolis Can Give You Some Real Beekeeping Service

We ship your order the same day it is received. Let us give you some of this service. Catalog for the asking. Write for prices on beeswax

THE A. I. ROOT COMPANY
873 Massachusetts Avenue, Indianapolis, Ind.

A Superior Quality At Less Cost

SUPPLIES

A Superior Quality At Less Cost

In offering supplies at our low prices, we are interested primarily in reducing the beekeeper's cost of producing Honey.

We realize it is impossible for the honey producer to reduce his cost of production unless he can buy his supplies at a reasonably low cost.

Our superior-quality supplies at our low prices are the solution to this problem.

We invite comparison of our prices on items listed below with the prices being charged by other manufacturers, and we wish to again emphasize the fact that the Diamond Match Co.'s supplies which we are offering are the best obtainable at any price, notwithstanding competitors' claims of superiority on the mere strength of their higher prices.

Hives, Supers, etc., listed below are in the flat, and are complete with Hoffman frames, nails, metal rabbets, and all inside fixtures.

One-story Dovetailed Hive

Five 8-frame	$16.00
Five 10-frame	16.90

Shallow Extracting Supers

Five 8-frame	$6.00
Five 10-frame	6.50

Standard Hoffman Frames

100	$8.50
500	40.00

Full-Depth Supers

Five 8-frame	$8.00
Five 10-frame	9.00

No. 1 Style Comb Honey Supers

Five 8-frame	$5.75
Five 10-frame	6.25

Shallow Extracting Frames

100	$6.70
500	32.50

Our Incomparable Quality Foundation

Medium Brood		Thin Super		Light Brood	
5 lbs.	82c per lb.	5 lbs.	90c per lb.	5-lb. lots	85c per lb.
25 lbs.	81c per lb.	25 lbs.	89c per lb.	25-lb. lots	84c per lb.
50 lbs.	80c per lb.	50 lbs.	88c per lb.	50-lb. lots	83c per lb.

Especially prepared Beehive White paint, one-half gallon cans..$2.10

Hoffman & Hauck, Inc.

Woodhaven, New York

HONEY MARKETS

U. S. Government Market Reports.

SHIPPING POINT INFORMATION, MAY 17.

SOUTHERN CALIFORNIA, LOS ANGELES.—Supplies of white honey light, of light amber grades heavy. Poor wire inquiry, movement slow, market dull. Carloads f. o. b. usual terms, per lb., white orange blossom 10-12c, white sage 10½-12½c. white alfalfa 7½-8½c, light amber sage 8-9c, light amber alfalfa 6½-8c. Hawaiian, white 7c, honeydew honey 4½c.

Recent hot winds have badly hurt orange and sage prospects, and with southern sage already seriously damaged by cold and dry weather, a very light crop of the lighter-colored honeys is forecasted. The alfalfa crop is probably normal. High retail prices are still maintained thruout California, and hurt honey distribution locally. Some large shippers expect a firm market on account of light crop this year; other factors are still pessimistic. New honey will move in light quantities this month and next; but shipments in large quantities are not expected before July. Beeswax sacked, in less than carlots, light 25-30c, dark low as 23c per lb.

INTERMOUNTAIN REGION, COLORADO AND IDAHO.—Shipments light; what sales being made are largely locally or to near-by towns. Fancy white alfalfa extracted is reported offered by some shippers at 7½c per lb. Other organizations continue to hold for higher prices. Inquiry from domestic trade very light; but inquiry from import trade reported to be increasing.

TEXAS POINTS.—The storm period in April killed large amounts of brood by chilling; put an end to the expected early mesquite flow, and cut down the huajilla flow to perhaps one-fourth of normal yield. Horsemint and summer mesquite flows should be good. The beekeeper is being paid on the basis of 12c per lb. for light amber extracted. Shipments from Texas are largely to comparatively near-by points, practically nothing going to the larger markets of the East.

NEW YORK STATE.—Bees are in good condition, except short of stores. The amount of last year's crop still on hand varies widely with different sections of the State. Some white clover honey is quoted at 17c per lb. in 10-lb. pails, or 15c in larger lots. Buckwheat honey is listed at 12c per lb. in 10-lb. pails, or 10c in larger lots.

TELEGRAPHIC REPORTS FROM IMPORTANT MARKETS.

BOSTON.—No carlot arrivals since last report. Almost no trading except in Porto Rico stock. Light demand, partly on account of low price of sugar and competition of maple products. Prices practically unchanged. Comb: Sales to retailers very few: New York, 24-section cases white clover No. 1, heavy $8.50-9.00, light $7.00-7.50; Vermont, 20-section cases white clover No. 1, heavy $8.00-8.50, light $7.00-7.50. Extracted: Sales to confectioners and bottlers, Porto Rico, amber, per gal., 80-83c. California, per lb., white sage occasional small lots 18-19c. Brokers' quotations delivered Boston, nominal prices unchanged, follow: California, per lb., white sage 15-16c, light amber alfalfa 10-14c, amber alfalfa 7-9c. Beeswax: Practically no demand or movement. No sales reported.

CHICAGO.—Since last report 2,000 lbs. Wis., 2,500 lbs. Ia., 1,500 lbs. Colo., 2,000 lbs. Minn., 1,800 lbs. Calif., 1,600 lbs. Ohio arrived. Extracted: Market weak and movement slow, particularly on light amber. Sales to bottlers. per lb., Iowa, Montana. California, white alfalfa and clover 11½-12¼c, light amber alfalfa 8½-9¼c. Comb: Sales to retailers. Iowa, Wisconsin, Minnesota, 24-section cans No. 1 heavy, $7.00-7.25 per case, light weight, $5.50-6.00. Beeswax: Receipts moderate of domestic and foreign. Market about steady. Slow demand. Sales to harness makers and wholesale druggists, Oklahoma, Missouri, and Montana, light 31-33c, dark around 25c. Imported, Central American and African, light 23-26c.

CINCINNATI.—On account of the refusal of the principal honey and beeswax receivers to furnish the information necessary to report market conditions and prices in Cincinnati accurately and completely, no report can be published for this important honey and beeswax center.

CLEVELAND.—No carlot arrivals since last report. Supplies moderate. Demand light, movement slow, market dull, prices slightly lower. Dealers quote, extracted: In 5-case lots or more, per lb., western white sweet clover 11-12c, medium amber alfalfa 9c.

DENVER.—Market continues quiet. Demand and movement very light. Sales to jobbers, per lb., extracted: Colorado, white and light amber 10½-13c, amber 10c. Comb: Colorado, 24-section cases No. 1 white $6.08, No. 2, $5.63.

MINNEAPOLIS.—No carlot arrivals. Extracted: Supplies light. Demand and movement slow, market dull. Sales to retailers, bakers and confectioners, 60-lb. cans Wisconsin, white clover, very few sales 12c per lb. Nevada, white sweet clover, very few sales 13c per lb.

KANSAS CITY.—No carlot arrivals since last report. Supplies of comb light, of extracted liberal. Demand and movement moderate on comb, light on extracted. Extracted: Sales to jobbers, Missouri and Kansas, light various flavors 10-11c. California, Colorado, and Utah, extra light amber and white alfalfa 10c. Comb: Sales to jobbers, Missouri, 24-section cases alfalfa and sweet clover mixed, No. 1, $6.50-7.00.

NEW YORK.—Domestic l. c. l. receipts light. South American and West Indian receipts light. Supplies liberal. Practically no demand or movement, market weak and quiet, very few sales. Extracted: Spot sales to wholesalers, confectioners, bakers, and bottlers, domestic per lb.. California, light amber and white alfalfa, best mostly 8-9c, off grade low as 7c: white orange blossom and white sage, best 11-12c, few 13c. West Indian and South American, refined, best 5½-6c per lb.; or 55-60c, mostly 60c per gal., few high as 70c. Combs: Supplies very light. New Yorks, 24-section cases clover, few sales mostly $8.00. Beeswax: Domestic receipts very light. Foreign receipts moderate. Supplies liberal. Demand and movement very slow. market dull, very few sales. Spot sales to wholesalers, manufacturers, bleachers, and drug trade, per lb., South American and West Indian, crude light, best mostly 26-27c, few 28c, slightly darker 22-24c, dark 18-22c. African, dark best 17-18c. poorer low as 15c. Cuban, light 22-24c, dark 18-20c.

PHILADELPHIA.—Very light receipts, mostly near-by stock. Very little demand but market continues steady, with all buying on a small scale. Extracted: per gal., sales to bakers, Porto Rican amber 55-60c. Cuban, light amber 65-70c. Demand light with very few sales. Beeswax: Receipts light, but market has a firmer tone Sales to manufacturers, Brazilian and Chilean, light 26-28c. African, dark 16-17c.

ST. LOUIS.—Comb: No receipts reported. Supplies light. Demand and movement limited to small lots, market very dull, practically no change in prices. Sales to retailers, Colorado, 24-section cases white clover and alfalfa No 1, heavy around $8.00, light $7.00. Extracted: No receipts reported. Advices from the South indicate movement of new crop will start from there probably in another month. Supplies are liberal. Almost no demand or movement, very few sales. Market weak. Sales to wholesalers, per lb., Missouri, Arkansas, and Mississippi, light amber various mixed flavors, in 5-gallon cans around 11c, dark around 10c; in bbls., dark amber various mixed flavors nominally low as 9c. Beeswax: Receipts very light. Supplies moderate. Very little demand or movement, only activity consists of buying of small lots by jobbers who anticipate turning stocks to manufacturers later on when business has recuperated. Sales to jobbers, Missouri, Arkansas, and Mississippi, ungraded, average country run mostly around 23c per lb. At present practically no demand from manufacturers.

GEORGE LIVINGSTON,
Chief of Bureau of Markets.

Special Foreign Quotations.

LIVERPOOL.—Since our last report there has been a better export inquiry, but prices are still lower. Some business has been done on the spot in Cuban, but the prices are not reported. The value of extracted honey at today's rate of exchange is about 6½c per lb. The value of beeswax in American currency is about 25c per lb. Taylor & Co.

Liverpool, England, May 6.

Opinions of Producers.

Early in May we sent to actual honey producers, scattered over the country, the following questions:

1. Has honey moved more rapidly during the past month than previously, and what percentage of last year's crops remain in the hands of the producer? Give answer in per cent.
2. What is the condition of the colonies at present compared with normal considering strength, amount of brood, and amount of stores? Give answer in per cent.
3. What is the condition of the honey plants at this time compared with normal? Give answer in per cent.

For the southern States and California the following additional question was asked:

4. How does the honey flow thus far compare with normal? Give answer in per cent.

State.	Reported by	Moving more.	On hand.	Col. Con.	Plant Con.	Hon. Flow.
Ala.	J. M. Cutts	..	70	100	100	100
B. C.	W. J. Sheppard	...	0	100	100	...
Cal.	L. L. Andrews	..	3	90	60	15
Cal.	M. H. Mendleson	...	0	50	10	0
Cal.	Geo. Larinan	...	20	65	40	15
Col.	J. A. Green	No	10	100	100	...
Fla.	Ward Lamkin	No	5	100	100	100
Ida.	E. F. Atwater	No	8	100	100	...
Ill.	A. L. Kildow	5	15	100	50	...
Ind.	E. S. Miller	No	28	90	100	...
Ia.	F. Coverdale	...	0	100	100	...
Kan.	J. A. Nininger	No	0	60	80	...
La.	E. C. Davis	...	20	100	100	...
Md.	S. J. Crocker, Jr	No	5	100	90	...
Mass.	O. M. Smith	Yes	5	100	100	...
Miss.	R. B. Willson	Yes	10	100	125	75
Mo.	J. W. Romberger	...	0	90	90	...
Neb.	F. J. Harris	...	10	75	50	...
N. J.	E. G. Carr	...	5	50	50	...
N. Y.	Adams & Myers	Yes	10	150	100	...
N. Y.	F. W. Lesser	Yes	0	100	100	...
N. Y.	Geo. H. Rea	No	10	100	100	...
Ohio	Fred Leininger	...	0	100	100	...
Okla.	Chas. F. Stiles	No	0	80	70	...
Ont.	F. Eric Millen	No	1	110	100	...
Pa.	Harry Beaver	No	0	90	100	...
Tex.	F. A. Bowden	Yes	2	100	80	25
Tex.	J. N. Mayes	...	2	50	25	15
Tex.	H. B. Parks	No	5	90	66	25
Utah	M. A. Gill	...	10	100	110	...
Va.	J. H. Meek	No	100	100	100	...
Wash.	G. W. B. Saxton	No	15	110	110	...
Wis.	H. F. Wilson	Yes	18	25	98	...

Special Telegraphic Reports from the Clover Region.

Just as we are closing the forms for this issue white clover and alsike clover are coming into bloom in parts of the clover region. In some localities the hot and dry weather of the past few days threatened serious injury to the clovers, and earlier damages from frost were reported from certain regions. though timely showers in the northern portion of the clover region have given beekeepers renewed hope of a good crop. In order to obtain the latest information as to the condition of this important honey plant, telegrams were sent out to several producers in the regions affected. Replies have been received May 24, as follows:

STOUFFVILLE, ONT.—Clover prospects poor as a rule east of a line running north from Toronto to Orillia. Little injury from recent frost here in York county. No reports from other localities. Drought not severe here and broken yesterday by nice rains.—I. L. Byer.

FLINT, MICH.—About 25 per cent normal amount of clover, and damaged 50 per cent by frost and drouth.—Leonard S. Griggs.

PUTNAM, ILLS.—The drought of July and August, 1920, killed practically all the white clover, and the freeze of April killed all the young clover from seed this spring. No prospects for any white honey this season.—A. L. Kildow.

MILWAUKEE, WIS.—Dry weather last fall was hard on clover, but abundance of rain this spring makes probable a fair crop. Frost did not injure it. Estimate crop at 75 per cent of normal.—Chas. B. Blaker.

GEORGETOWN, ONT.—Recent clover injury slight, if any. Frost not serious. No real drouth. Only two very hot days; then general rains and cooler Sunday relieved situation. Not much surplus honey expected. Very little good weather for early bloom may leave colonies hungry in June, cutting down clover supplies.—Morley Pettit.

EAST LANSING, MICH.—Clover not injured by frost, but lack of rain is seriously affecting it now. —B. F. Kindig.

AMES, IOWA.—No clover injury reported or observed.—F. B. Paddock.

JANESVILLE, MINN.—Past 10 dry months rendered white clover plant scarce. Alsike good. Late frosts destroyed half basswood bloom.—E. L. Hofman.

KINDE, MICH.—Clover not injured with frost. Drouth broken May 23. It has been very dry but clover good.—David Running.

DR. PHILLIPS, BUREAU OF ENTOMOLOGY, DESIRES SAMPLES DISEASED OR ABNORMAL BEES.

The Bureau of Entomology desires to obtain samples of adult bees which appear to be affected with any of the known diseases, or which are in any way abnormal. Live bees in mailing cages are preferred, but dead bees in wooden or stout cardboard boxes will be useful. They should not be mailed in bottles or tin boxes. The name and address of the sender should be placed on each lot and the package mailed direct to Dr. E. F. Phillips, Bureau of Entomology, Washington, D. C. The results of the examination will be reported promptly by Dr. Phillips. The co-operation of beekeepers will be appreciated. (See editorial.)

BOOKS AND BULLETINS.

The Vitamine Content of Honey and Honey Comb, by Philip B. Hawk, Clarence A. Smith, and Olaf Bergeim, from the Laboratory of Physiological Chemistry of Jefferson Medical College, Philadelphia, has been reprinted from the American Journal of Physiology, Vol. IV, No. 3, April, 1921.

Mixed Infection in the Brood Diseases of Bees, by Arnold P. Sturtevant, Specialist in the Bacteriology of Bee Diseases, Bureau of Entomology, United States Department of Agriculture, has been reprinted from the Journal of Economic Entomology, Vol 14, February, 1921, No. 1.

Special Notices by A. I. Root.

THE HUBAM CLOVER THAT WINTERED OVER.

On page 374 I gave you a picture of a clump of this clover photographed May 9, when it was 11 inches tall. It is now, May 24, 27 inches high and spreading out sidewise, so it is about as far across as it is tall. Some of the plants that wintered over are budded to bloom, and give promise of honey for the bees, far in advance of the old biennial.

THE ELECTRIC WINDMILL DURING THE PAST WINTER.

On page 170, Gleanings for March, I mentioned the fact that we were having less wind during the past winter; and I finally suggested a very small gasoline engine to back up the windmill during an unusual period of no wind. Right after that was written, however, we had beautiful winds with scarcely a failure until we left our Florida home the last of April. The batteries were all kept well charged without any trouble, and a few times the windmills were stopped because we did not need the current.

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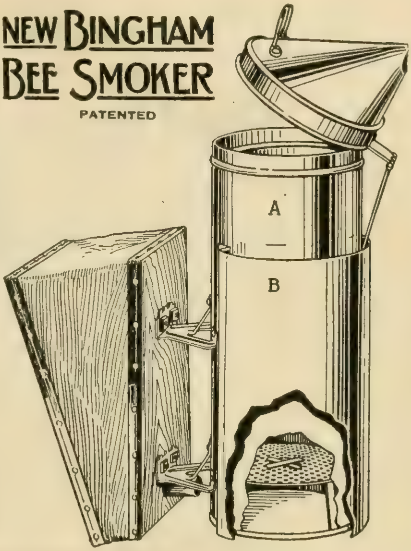

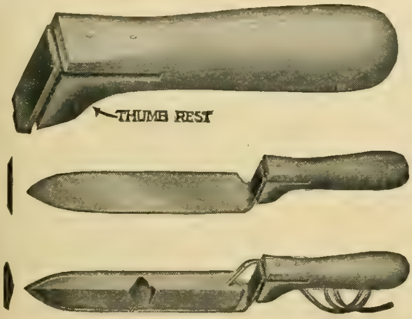

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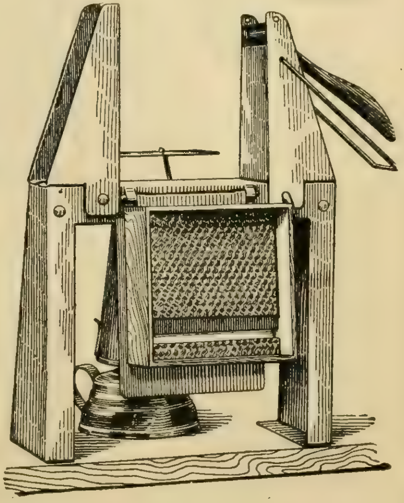

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GLEANINGS IN BEE CULTURE

JUNE, 1921

EDITORIAL

A Circuit of Conventions.

THE American Honey Producers' League thru one of its committees is endeavoring to arrange with the officers of various beekeepers' associations to hold their annual meetings on consecutive dates in adjacent States, thus arranging a circuit of meetings. Such an arrangement would enable one person to attend several conventions without excessive traveling expense, and would thus make it possible to secure speakers in many cases who would not be able to attend if a separate trip were necessary for each convention. It is to be hoped that the various associations will co-operate with the League committee in arranging for such circuits of meetings in various parts of the country.

* * *

Mixed Infection in the Brood Diseases of Bees.

IN a paper published in the Journal of Economic Entomology for February, A. P. Sturtevant, Specialist in the Bateriology of Bee Diseases, Bureau of Entomology, United States Department of Agriculture, discusses the subject of mixed infection in bee diseases.

Since the Bureau of Entomology began the examination of samples of brood diseases a total of 38 samples containing both American foul brood and European foul brood was received, 32 of which were received during 1919 and 1920, two in 1918, one in 1917, two in 1916, and one in 1911. It was formerly thought that mixed infection was of extremely rare occurrence, only one such sample having been found prior to 1916; but the number found during the past two seasons, when 32 out of 1391 samples examined contained both diseases, shows that mixed infection is by no means rare.

Of the total of 38 samples of mixed infection, 12 came from California and five from New York, the others coming from 11 widely separated States, chiefly from prominent beekeeping regions.

These are important facts for beekeepers located in regions where both diseases are imminent for when both diseases are in the same apiary and sometimes in the same colony, the problem of treatment becomes complicated. It is well known that if the shaking treatment used in treating American foul brood is given to colonies having European foul brood the trouble is often aggravated instead of being cured. When both diseases are found in the same apiary, and possibly in some cases in the same colony, Mr. Sturtevant recommends first the elimination of European foul brood by strengthening and requeening all the colonies with vigorous, young Italian queens, then treating any colonies which do not respond to this treatment as being American foul brood.

* * *

The Dr. Miller Memorial Fund.

AS INTIMATED in last issues of Gleanings and the American Bee Journal, the birthday of Dr. Miller, June 10, has been set aside as the date when we should, one and all, give expression in a practical way of our indebtedness to the great beekeeper and leader who has left us. Some letters that have come in expressing the writers' love for the man, accompanied with a remittance, almost bring tears to one's eyes. For example, a young girl, crippled for life, who in her earlier years had paid her way thru college with the money she had earned with her bees, sends a dollar. After she had gotten thru college a serious spinal trouble developed, with the result that she is confined to her bed much of the time, being able to get about with difficulty only by means of crutches. Of course her earning power is gone largely; but she has not forgotten Dr. Miller. She did it out of pure love.

Another incident comes to our mind of a young man who started with few bees, and with their help he is putting himself thru college. He has been a great lover of Dr. Miller and his writings; and even tho the dollars come hard during these strenuous times, and even tho their purchasing power is only about half their value during the pre-war days, this boy sends in five dollars.

Several have proposed to establish a professorship in apiculture in some college, a scholarship, a beekeeping library at some apicultural school, or a monument with a suitable inscription, the same to stand over the last remains of him who left his charm and impress on the beekeeping world.

Unfortunately, there has been drive after drive to help the poor and the starving in Europe, in Armenia, and in China. There have been various war drives until the pockets of many of us have been drained almost dry. These were all worthy. If this Dr. Miller memorial fund could have been raised at any other time, it would have been better, of course. But the thought that the committee kept in view is not to ask for large sums, but a fund which the beekeepers of the world feel that they can give, large or small. No gift will be too small. So far subscriptions have been coming in in sums all the way from fifty cents to a dollar. If we can not establish the Dr. Miller chair of apiculture at some college, we can provide a library or a monument.

We hope, therefore, that those of our readers who have not contributed to the Miller memorial fund will take advantage of the opportunity to do so right now before you forget it, by sending in whatever amounts you feel you can afford to give. June 10 has been suggested as the day, and we hope, therefore, that the responses will be prompt and liberal.

The Isle of Wight Disease, Again.

IN OUR last issue, page 265, we referred to the fact that the cause of the Isle of Wight disease had been discovered by John Rennie, Phillip Bruce White, and Elsie J. Harvey. Since last issue we have taken time to go thru their paper very carefully. We regard it as one of the most valuable that has been put out during the present decade—valuable, of course, to our cousins in Great Britain where the disease is rampant, and valuable to us in America, because, knowing the cause, we can determine whether we have anything of the kind here, and how to treat it. From the reports we have received, we regard it as one of the most serious diseases of adult bees known to bee culture—yes, possibly even more serious than either of the brood diseases, bad as they are. While at present the Isle of Wight disease is confined entirely to Great Britain, there is no knowing when the scourge may visit us, altho it is to be hoped that repressive measures will prevent it from coming to our shores. Every beekeeper should know something of the cause; and for that reason we are endeavoring to give our readers, as far as our space will permit, a brief survey of the contents of this paper.

For many years the cause of this disease was unknown. In 1912 and 1913 it was believed that it was due to a protozoan, *Nosema apis*; and this view was held until 1920, when Drs. Rennie and White, and Elsie J. Harvey of Great Britain (particularly the last named), discovered that the primary cause was not due to a protozoan or a bacterium, but to a parasite or a mite, *Tarsonemus woodi.* This parasite, according to their paper, published in the Transactions of the Royal Society of Edinburgh, Vol. LII, Part 4, attacks the bees thru the breathing orifices. To quote exactly it "occupies a very restricted region in that part of the tracheal system which has its origin at the anterior thoracic spiracle. In a well-established case of infection it will be found that, extending inward from this spiracle on either side indifferently, parasites in all stages of development may be present in any part of this portion of the respiratory system, whilst the ill effects of their presence may be seen not only in the region of occupation but in the muscular tissue to which these extend. * * * The primary parasitic invasion takes place thru one or both of the first pair of spiracular orifices, and apparently thru these alone."

In speaking of bees obtained from Italy and elsewhere, Dr. Rennie says: "In all, several hundreds of bees were obtained from this source. These, along with others obtained direct from Italy were searched for the presence of *Tarsonemus.* The result of these examinations was that the bees were found entirely free from the parasite. The evidence is so far satisfactory that it may be accepted that *Tarsonemus* is not being introduced to this country in Italian bees. Smaller numbers of Dutch bees so imported have also yielded on examination a similar result. Bees in limited numbers have also been obtained from Switzerland and from North America, all of which were also free from this parasite." On the question of whether bees in England are more susceptible to this disease, Dr. Rennie says again:

"It has been suggested that British bees of the present time are of a deteriorated breed, and have lost resisting power, so that *Tarsonemus*, a relatively non-pathogenic parasite ordinarily, is able to breed excessively. My provisional answer is that other racial forms are relatively affected. For example, Egyptian, Dutch, Punic, and Italian bees can be readily infected, and in these *Tarsonemus* multiplies with disastrous results, as in British bees. But the question of the ability of a stock to survive a prolonged period of *Tarsonemus* infection is not a simple one. Amongst other factors it involves the question of relative fertility of particular queens, as well as that of individual tolerance of the parasite."

Provisionally it may be hoped that there is no disease of the kind here. The nearest to it that is found here is what is known as the disappearing disease. But this has one marked characteristic or symptom that is decidedly different from any found in the Isle of Wight disease. Colonies infected with the latter seldom recover without treatment, and the disease continues on unabated unless there is an extra good queen, in which case she may supply new bees faster than the old bees die off. In the case of the disappearing disease of this country, so far as known, the malady or disease or whatever it is, never lasts more than 10 days, at the end of which time the trouble disappears—hence the name, disappearing disease.

It appears that the parasite, *Tarsonemus woodi*, may be found in apparently perfectly normal or healthy bees. Bees carrying the mites will go to the fields and apparently function as well as bees that are healthy or without the mite; but, as the parasite begins to develop, the first symptom of their host or victim will be its inability to fly, altho it may appear to be perfectly normal in all other respects. After a time it joins other affected bees out in front of the entrance of the hive, there to die. The disease, therefor, is insidious in that a beekeeper may have it and not know it until in the later stages he finds evidence showing disjointed wings and many bees crawling around in front of the entrance. It is rather remarkable, even where only one or two of the first pair of spiracles may be affected, that paralysis of one or both of the wing muscles takes place. Apparently the perfect functioning of the first pair of tracheae is necessary in order to insure a normal flight on the part of the bees.

That the closing of the spiracles from any cause has a direct influence on the wings is proved by the fact that the same effect is produced by using any other means of closing these openings, such as warm paraffin. Experiments by Rennie have shown that, when these orifices are closed with paraffin, flight is made impossible almost immediately, altho the bee seems to be perfectly normal in all other respects, and may continue so for several weeks at a time. The fact that it can not fly, however, soon results in the clogging of the intestinal passage. This was what gave rise to the belief that the disease or malady was due to a protozoan or bacterium in the intestines. Bees normally will not discharge their feces except in flight.

In this country beekeepers will often find in the apiary crawling bees unable to fly. Such bees are not infrequently found at the beginning of a honey flow or during a temporary attack of disappearing disease. While it is possible that the parasite may be in this country, the presumption is rather in favor of the supposition that some foreign substances—possibly some dirt or pollen grains—have closed the first pair of spiracles, thus bringing on paralysis of the wings. Until more definite proof is furnished, this can be only a surmise or a guess. Until then the beekeepers of the United States should send all cases of bee paralysis, disappearing disease, and all bees around the entrance that are unable to fly, to Dr. E. F. Phillips of the Bureau of Entomology, Washington, D. C. It is highly important that all such be examined at once.

In the mean time the hope has been entertained in this country that the Isle of Wight disease can not thrive here. The climatic conditions in this country are so different from those in Great Britain that a disease that might thrive in a damp or humid atmosphere might find it difficult to get a foothold here. The last quotation given above would seem to indicate that the hope is not well founded, because the authorities state that other races of bees can be readily infected with the parasite The work done by Rennie, White, and Harvey in finally locating the cause of the Isle of Wight disease is invaluable. But the one first to discover *Tarsonemus* in the tracheae of honeybees was Elsie J. Harvey. This is not the first time that a woman has come forward with some great discovery. The knowledge of the cause of the disease may now suggest a cure.

Suggested Cure for Isle of Wight Disease.

It has been found that *Tarsonemus woodi* affects mainly the old or field bees. It is seldom found on young bees. Whether the mite or parasite lodges in the blossoms that have been infested by other bees is not yet shown; but, in the absence of any evidence to the contrary, it may be inferred that flying bees going to a neighboring hive by mistake might carry the parasite from colony to colony. One would naturally expect, as in the case of foul brood, that the hives near the one infected, with the entrances in the same direction, would soon have the parasite. It would also be inferred that the pests would be carried thru the agency of robbing. It might also be transmitted thru hives and appliances.

Nothing in the report by Rennie, White, and Harvey gives a treatment or cure for the Isle of Wight disease; but it has been suggested in the British Bee Journal that traps might be used to catch the incoming bees of colonies badly infected, and then giving young vigorous queens so that the new young blood would take the place of the old. If all the bees carrying the parasite could be trapped out there would be a possible chance that their successors might be freed from the parasite.

In the Bee World (British) reports have shown that the destruction of all bees in colonies affected with Isle of Wight disease, and putting the brood and the queen in an incubator until most of the brood emerges, effects a cure. As only the adults are affected, especially the flying bees, this looks reasonable and in entire harmony with the facts regarding the now known cause. It is to be hoped that this cure will be absolute. If so, it will be no more difficult to apply than the cure for American foul brood, based on the same principle of the removal of the infected material.

THE PREVENTION OF SWARMING

Importance of Comfort and Contentment of the Bees. The Swarming Problem a Blessing in Disguise

By Morley Pettit

OUR first step towards the prevention of swarming is to enlarge the entrances of the winter cases when the bees begin to cluster down in the bridges in early April. The next is to add a super of number-one brood-combs without the queen-excluder as soon as the original brood-chamber is well filled with bees, on a day too cool for bees to fly. We do not wait for the combs to be filled with brood and honey. This is the last of April or early in May, and the fact that all are still protected by winter cases allows us to super more liberally without fear of changeable weather. The extra combs given at this time should all be dark; but, if such are limited, there may be dark ones in the middle of the super and light ones at the outside. The queen generally goes up into these quite readily and starts a new broodnest. Possibly the fact that conditions are similar to those of a newly hived swarm tends to a state of greater contentment. At any rate, if she has ability she develops her new quarters upstairs with great vigor, and we are saved the swarm of bees in May for which we would not trade a good-sized forkful of hay. If the ancient poet had said that a good strong colony in May is worth a load of hay, and to prevent swarming in June is worth a whole cabinet of silverware, he might have been guilty of "*vers libre*," but he would have taught good beekeeping.

Extra Supers Given Early.

We often get a honey flow early in May that would drive the queen down again by filling her new brood-chamber with honey, if we did not add an excluder and an extracting super on top of the double brood-chamber. Again, we do not wait for a crowded condition, but keep on supering as long as the colony has bees to go in and *sit on the combs* if nothing else. We try to forestall any clustering out. Contentment in the hive is the keyword to swarm prevention, and the secret of this is room for brood, stores, *and bees*. The first two are often stressed in articles on this subject, but seldom the latter. There should be space inside for all hands to go in, even when it rains, and ventilation so they *will* go in when it is hot. Usually by the time the queen has had her upstairs apartment for three weeks or four at the outside, she has forgotten the old one downstairs and it is time to ask her to move down again. If we neglect this, the lower set of combs is ruined with an excess of pollen. We cannot wait for the beginning of the clover flow as is so often advised. As a matter of fact we find something profitable to do to each colony almost every eight to ten days from the time queen-clipping starts — the last week in April, if the season is early as it is this year, till it is all over in the fall. And we find that it gives best results to super as the colony develops to prevent crowding or clustering out, regardless of the filling of the supers, until we know definitely that the flow is over or nearly so. In every case the fresh super is placed next to the brood-chamber.

Now if supering is attended to as I have tried to indicate, and *a little in advance of the need in each case*; and if the queen has been allowed to "swarm" upstairs to a nice set of dark worker combs and then placed downstairs on her old combs while they are still in the best of condition, and before the brood has all emerged from them, we feel that we have done all that the colony can reasonably expect of us to make them contented in the old home. Besides giving ample clustering and storing space we have twice given brood-chamber conditions which resemble, to some extent, those of a freshly hived swarm.

The second time, the brood is hoisted to the top of the hive. On the next visit this brood is in prime condition to make nuclei for queen-rearing and increase. If not needed for either, it stays right there to add its bees to the colony and then be used for honey storage. Have you a sentiment against using brood-combs for honey? Our customers have none. And they buy from us year after year. And what about the queen-cells? We use some of the best of them for nuclei when we know the stock is good, and destroy the others. Perhaps we could safely neglect them, but we hate to take the chance.

Keep Colonies Contented.

I have outlined above our method of preventing swarming. It is a method which is effectual in the majority of cases. To disrupt violently the colony organization is as repugnant to us as we feel it is to the bees. It is to be resorted to only in extreme cases, and in our system is seldom worse than that of leaving a full colony queenless from one visit to the next. With all deference to successful beekeepers who practice such things, I would liken the system of treating a whole yard at once to rapine and violence like "shooking" or "Demareeing," to a surgeon who would amputate the right leg of every patient in a large hospital because some of them needed such treatment and others might.

We go thru our colonies every six to eight or nine days. This periodical examination serves a number of purposes and has a bearing on the prevention of swarming. By means of it supering is attended to, and the queen is kept supplied with empty cells for her eggs. If the brood-chamber becomes crowded, it is necessary to remove, first, combs of honey; then combs of the ripest brood to make room for an empty comb or two. But to say that we ''prevent swarming by raising combs of brood into the super'' as some have said, is to grasp for a rule where a rule is unwise if not impossible, and miss the spirit of the system. When we find that queen-cells have been built we destroy them; but to speak of preventing swarming by ''cutting out the queen-cells'' is to miss the point entirely, for the sort of practice which that implies is nothing but locking the stable after the horse is stolen. Perhaps it is not quite so bad, and a balky horse may be better than none at all.

Treatment for Balky Colonies.

Unfortunately we do have some balky horses—I mean sulky colonies, and that is the bearing that the periodical examination of the brood-chambers has on the prevention of swarming. To go back a step, we start queen-rearing operations as early as possible in the summer, so as to have a batch of young laying queens in nuclei in each yard. This most important part of the season's operations belongs exclusively to Miss R. B. Pettit, and I shall not attempt to go into details, further than to say that I sincerely hope that we shall never be subjected again to the necessity of having our queens come to us thru the mails. When on the weekly round colonies are found with eggs in queen-cells we consider that the impulse to swarm is still insipid, and that perhaps supering or ventilation has been neglected. We destroy all cells that have eggs and care for the other conditions, and give the hive a special mark. Next trip, if cells with eggs only are again found, we may again destroy them and attend to other conditions, and again mark and leave the hive, provided the queen is doing well and the general morale seems good. Where cells with more than eggs are found after we have done our part by supplying room and ventilation we blame the queen. Either she transmits to her progeny by heredity a swarming tendency, or she is failing and needs to be superseded. She is removed from the hive and a young laying queen is introduced in her place after the colony has built cells for about eight days. That requeens the colony and settles its swarming notions for another year. It was from P. H. Elwood of New York State that I first got the idea of checking a persistent swarming impulse by taking out the queen, and we have adopted his name for the nucleus we make to give her work, and call it a ''take out.'' A ''take-out'' readily grows into a colony for increase, and can be requeened later when there are young queens to spare at the end of the season.

Before the brood has all emerged in the lower story the queen is put below the excluder.

I have tried to present the matter of swarm prevention, shorn of manipulation trimmings, as it appears to me, and may be pardoned for going over the ground once again. In our ''locality'' the swarming impulse is the beekeeper's greatest enemy. The control of disease and winter conditions are child's play compared with it. Yet, like all other enemies in agriculture, it is a blessing in disguise. It compels us to give our colonies careful attention. We fight this enemy on two fronts, selection in breeding, and manipulation. While selecting less-swarming strains we also select honey-gathering strains and those that carry their honey upstairs instead of crowding the queen. The ventilation and method of supering which help to control swarming by promoting colony morale stimulate honey-gathering and increase the crop. The new brood-chamber twice given in the early part of the season increases brood-rearing at the most important time. Every time we look over the brood-combs to see whether our swarm-prevention methods are successful we have a chance to detect disease on the start, and we study the behavior of each queen so as to replace her when she begins to fail. This seems more satisfactory than to attempt a wholesale requeening of every colony at a certain time whether it needs it or not.

It would be an ideal condition if all the colonies in an apiary were as uniform as the hives. Then the expert could go to an apiary, examine one hive and instruct his helpers to give certain treatment to them all. If all the queens were of the same age and parentage and the colonies came thru the winter of uniform strength, this might be wisely done. Such uniformity is something to strive for, but until it can be obtained we find it profitable to consider each colony a separate patient, and the expert, the physician to diagnose and prescribe. Even leaving a colony without a queen for a week or so is injurious, but we do not think it does so much harm as some of the ripping-up methods advised for every colony whether it needs them or not. When by care most of the colonies can be brought thru the season with no more serious "operation" than a change of queens, without any queenless period, the increased profit more than pays for any extra trouble.

The Building of Combs.

I think it was Arthur Miller who said in The American Bee Journal with reference to numerous methods of wiring frames, "It's too bad, boys, to spoil all your fun, but just use heavier wire." I would add to that, use heavier foundation. Where we have the wax to use, we have it made six or seven sheets to the pound instead of the regulation eight. We do not fasten it to the top-bar. An extra horizontal wire one-quarter inch below the top-bar, supported in the middle by a staple, holds up the top edge until the *bees* fasten it. That is the first thing they do, if the frame of foundation is given them under right conditions, and they can do it while we are doing something else.

We never put foundation in a brood-chamber—that is, where you get it cut away from the bottom-bar. It should almost touch the ends of frames and come so near the bottom-bar that it will be built fast, yet not close enough to buckle out and spoil the lower part of the comb. If sheets of foundation properly fitting the frames and well fastened to the wires by proper imbedding are given to colonies under right conditions, good combs will result.

Our supering works out about like this: First, the extra brood-chamber of worker combs; next, a set of number-two combs. These are combs built on foundation but spoiled for brood-rearing by stretching or buckling. After combs of all descriptions, built on foundation, have been used, supers of foundation are put on next. Sometimes we put down a few partly filled combs into the super, which is going on, to help make a connection between the brood-chamber and the super work—that is, when it is empty combs going on. When colonies are rousing strong and the flow is good we do not consider this of much importance, and seldom mix combs with foundation. They bulge the combs over against the foundation to the disadvantage of both. When a colony, having three or four Langstroth supers of combs nearly full of green honey, is given a super of foundation between them and the brood-chamber, it fills up almost as rapidly as tho it were of drawn combs, provided the flow is still strong. If not, the foundation will be drawn out at least enough to pass for comb next season, and the ripening of the honey above will be hastened. So, with combs enough to hold two-thirds of the crop and tide the colonies over the most critical time for the swarming impulse, supers of foundation for the rest of the honey flow are rather an advantage all around. We like to reserve all drone combs to give room when taking off the crop.

Georgetown, Ont.

One of Morley Pettit's out-apiaries well protected from prevailing winds.

THE DR. MILLER OF THE SOUTH

An All-around Genius; a Pioneer in the Successful Use of an Extractor Reversing on a Central Pivot

By E. R. Root

I HAVE said several times that there was only one Dr. Miller in the world, and that there would never be another one; and while that statement is literally correct, if there is any man in the whole Southland who has in him some of the delightful personalities of the sage of Marengo, it is T. W. Livingston, Norman Park, Ga. He is comparatively unknown to the beekeeping world; but one can not be in contact with him very long without being impressed that here is a beekeeper of more than average intelligence. Almost as old as Dr. Miller, he has a lovable mannerism and a knowledge of bees and bee behavior that is seldom surpassed. No, he is not quite like Dr. Miller, in that he is not given to playful jokes; but he is *like* him because he is so likable, and knows so much that's worth knowing.

T. W. Livingston the Dr. Miller of the Southland. While he does not look like Dr. Miller, yet in age, experience, and actual knowledge of bees, he is very much like him; and on top of it all he has Dr. Miller's loving mannerism.

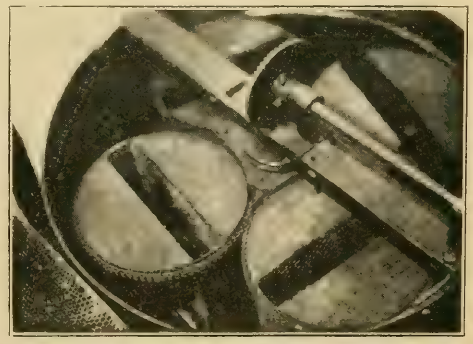
Mr. Livingston is somewhat like another doctor well known in beedom. I refer to Dr. G. L. Tinker, an inventor and mechanic. If you could take Dr. Miller and Dr. Tinker and make a combination of the two you would have Livingston. A short time ago I wrote him in a letter that he reminded me of Dr. Miller. He came back with the statement, ''I do not think myself worthy to be called the Dr. Miller of the South.'' That is Mr. Livingston all over. He is very modest—extremely so—and that is why we have not heard more of him.

But why is he like Dr. Tinker? If you could go thru his workshop you would see that he is a fine mechanic; and not only that, he could have become a mechanical engineer, and a first-class one, had he qualified for that in his younger days. I will explain later why I think so.

Mr. Livingston is a northern man who went south. He has been keeping bees in a modest way both north and south, and, like many another genius, he has studied his locality most thoroly, so that he probably knows more about Southland conditions than many men who have lived there all their lives. For example, his knowledge of honey plants, for one who does not pretend to be a botanist, is remarkable. He not only can give instanter the English but the Latin names of all the important honey plants in the South. As our readers know, we have in preparation quite an extensive volume, ''The Honey-bearing Plants of North America,'' by Lovell. Naturally enough I was pleased to find a man who could assist Mr. Lovell.

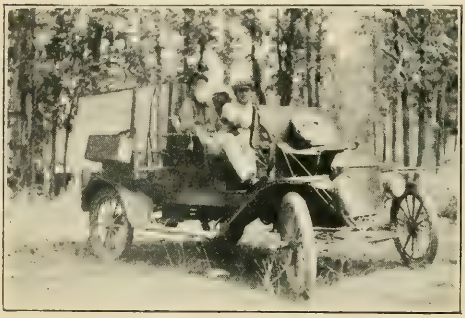
Central-Pivot Reversible Extractor.

But the thing that, perhaps, interested me more, and the thing that caused me to visit Mr. Livingston in the first place, was his four-frame central-pivot reversible honey-extractor. Some 12 years ago, in considering the two plans of reversing the combs in the extractor he decided on the type of machine that is now coming rapidly to the front; and during all these years our friend has been using this extractor—the same model that he made at first. It is light, portable, and stands service. The scheme of reversing the pockets is original with him, and quite unique. One would almost think it had been worked out by a trained mechanical engineer. In any event it would take a mechanic to make it. Had



This is a top view of Livingston's central-pivot four-frame reversible honey-extractor. Livingston was ahead of his time in deciding that this principle is correct. The reversing is accomplishing by means of a chain around each basket, communicating with a planetary-gear system surrounding the shaft. Mr. Livingston has used this for 12 years with complete satisfaction.

Livingston not been of the type of Dr. Tinker, he could never have built it in his own workshop. But he did. Unfortunately the principle does not lend itself to the use of power eight-frame extractors without adding complications. But it works on four-frame hand machines admirably.



Livingston's portable extracting outfit, all of it on a common Ford. It consists of a four-frame reversible extractor, uncapping outfit, and a takedownable wire-screen building. The whole thing can be put into operation in the space of a few minutes.

Mr. Livingston runs a series of outyards, using this extractor in all of them. When he goes to an outyard to extract he takes along not only his extractor but his portable takedownable extracting-house, made up of a series of wire-screen panels, all on a common Ford. On arriving at the yard it takes him only a short time to unlimber, set up his house, and begin extracting. At the end of his day's operations he takes down the whole outfit and loads it on his Ford as shown in the illustration, when he is ready to go home. The next day he is ready for another yard, and so on he goes thru all of his extracting. J. J. Wilder says that a central extracting station using power to drive the extractor is not practicable for this part of the South, and so Mr. Livingston is in line with the practice of the South.

He has worked out a system of management that enables him to accomplish a maximum of work with a minimum of labor and capital. For a man of his years he is able to accomplish an immense amount of work. He makes all his own supplies and some for his neighbors; and with the help of his son-in-law, who is associated with him, he is able to do quite a business in the production of honey.

In this connection perhaps I should acknowledge that both J. J. Wilder, who is located some 40 miles from Mr. Livingston, and Mr. Livingston himself, have called my attention to the fact that a mistake was made in Fig. 7, page 209 of April Gleanings. This is not the titi that yields what is commonly called the titi honey of the Southland. While it is a titi, and occasionally yields a little honey at times, it is not the titi of the Southland that interests beekeepers.

COMB HONEY PRODUCTION

The Spirit of the Hive. How to Increase the Crop by Speeeding up the Workers

By George S. Demuth

BY using forehanded methods previous to the honey flow, especially in reference to providing the bees with an abundance of stores to insure the greatest amount of brood-rearing during the six or eight weeks just preceding the honey flow, together with an abundance of room in the form of worker brood combs to prevent the beginning of any stagnation or discontent which might cause the bees to prepare to swarm, the colonies usually go ahead full speed doing exactly what the beekeeper desires they should do. When these two conditions have been provided, but little else need be done for the bees at this time, except such work as clipping queens and looking for disease, if disease is imminent. In other words most of the work previous to the honey flow can be done "by rule of thumb methods" and the needed attention can be given far in advance.

At the beginning of the honey flow the reverse of this condition is usually true, for the beekeeper must now be constantly on the job ready for any emergency if he expects to harvest a full crop of honey. Many things can happen during the honey flow to prevent the colonies from doing all that they are capable of doing in gathering and storing honey, especially in comb-honey production. Except when the greatest skill is used in the management during the honey flow a large percentage of the colonies will fall behind in the race, leaving only a few fortunate ones which have really done what they could. At the close of the season these few colonies, sometimes giving a yield double the average for the apiary, become witnesses bearing testimony as to the high cost of even some of the slightest mistakes in management.

After having provided conditions by which a great army of "harvest hands" are now ready, and others soon to be ready for the harvest, which in most localities suitable for comb-honey production is short in duration, the beekeeper should now get out of these workers every ounce of energy he can induce them to surrender for his profit. If anyone should have any sentiment against doing this, let him remember that the bees apparently are happiest when working the harvest. Let us increase their happiness.

Visible and Invisible Loafing.

Comb-honey producers are well acquainted with the tendency of bees to loaf, even during a good honey flow when conditions are not the most favorable. Sometimes the most trifling adverse condition upsets the spirit for work and brings visible loafing. At other times the loafing is less in degree and may not be noticed by the beekeeper. In either case it means a loss. Loafing, whether visible or invisible, usually increases until the cause is removed, and sometimes for a long time afterward. For this reason the prevention of even the slightest tendency to loaf during the honey flow is really one of the biggest problems with which a comb-honey producer has to deal. For, if this can be accomplished, serious loafing can be prevented and swarming can be greatly reduced. During some seasons most of the colonies that prepare to swarm could have been induced by better management to work energetically thruout the season without a thought of swarming.

Conditions Reducing Colony Morale.

Some strains of bees are more inclined to loaf than others. Old bees usually work less vigorously than younger bees, and colonies having old and failing queens usually work with less energy than colonies having vigorous queens. Queenless colonies, especially those hopelessly queenless, usually work with less vigor than queen-right colonies. It is well known that anything which causes discomfort to the bees within the hive, such as heat, lack of ventilation, or lack of room, may start loafing. Insufficient room for ripening and storing the incoming nectar or conditions suggesting a completion of the season's work, such as sealing honey down adjacent to the brood, as is normal at the close of the season, are strong factors in causing bees to loaf. Any conditions within the hive which in any way tend to check the freest expansion of the hive work, apparently checks the work of the field force almost immediately, and when the field workers begin to remain in the hive during the day in increasing numbers visible loafing is soon brought about. Colonies which surround the brood-nest with a rim of honey and confine their work to the brood-chamber, as at the close of the season, usually loaf badly. In fact, those conditions which were mentioned last month as bringing on a tendency to swarm, are the very ones which bring on a tendency to loaf. Even the destruction of queen-cells, in the attempt to induce a colony to give up swarming, often results in a bad case of loafing, except possibly when this is done soon after the queen-cells were started. When the beekeeper by force prevents the bees from carrying out their program in swarming after it has once been started, the bees often retaliate by loafing. Thus when bees and beekeeper work in opposite directions, the bees, not being permitted to have their own way, may take it out in sullen loafing in the midst of a good honey flow. In some things they can be led, but not driven.

Conditions Increasing Colony Morale.

It is not enough merely to prevent the tendency to loaf, but the workers should be stimulated to do their utmost while the honey flow lasts. Each of the field workers could surely make more than four or five trips for nectar during a day, which is about their usual average day's work.

Any condition which speeds up the work within the hive, especially by inducing the younger bees to leave the brood-nest to go to the supers earlier in their lives, tends to speed up the work of the field bees. The ideal condition for best work is that of providing a job for all of the bees which stay within the hive as soon as they are old enough for inside work. This is the condition in a newly hived swarm. Reducing the number of idle hive workers apparently speeds up the work of the field bees.

Beekeepers have long been familiar with the energetic work of a newly hived swarm, or of a colony just beginning a new job, such as preparing a set of newly added extracting combs for incoming nectar, especially when these combs are placed adjacent to the brood with but little if any honey between. If the stimulus resulting from the beginning of a new job could be sustained thruout the honey flow, no doubt the field workers would each carry in six or eight loads of nectar per day instead of four, thus increasing the crop of honey in proportion. This is exactly what the skillful beekeeper attempts to do, and the extent to which he is able to keep his bees contented and to stimulate them to put forth greater effort determines to a large extent the amount of honey he can produce with the working force which is available during the honey flow. By skillful management during this time the beekeeper is able to secure yields of honey probably never equaled by colonies of equal strength in their natural state, and certainly never equaled by colonies that are neglected.

Effect of Skillful Supering.

After the honey flow has begun, a stagnation of colony activity must be prevented and the stimulus of new work must come, to a large extent, thru the management of the supers. This is where the production of extracted honey by giving empty combs adjacent to the brood, offering a new job for the bees again and again as more room is needed during the honey flow, gives the producer of extracted honey a great advantage. The nearer a comb-honey producer can approximate these conditions, the nearer will his yield approach that of the extracted-honey producer.

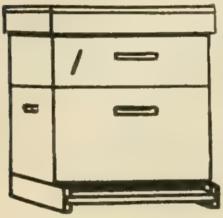


Fig. 1.—A prompt beginning in the first super is important.

In comb-honey production much can be done to entice the multitude of oncoming younger bees out of the brood-chamber early in their lives by giving them work in comfortable and attractive supers. The drawing out of full sheets of fresh foundation, the building of new comb, and the ripening and moving about of the raw nectar when carried on extensively by the hive workers, apparently all tend to stimulate the field force to bring home more loads of nectar during the day. At the same time the absence of the field force from the hive during the heat of the day must add greatly to the comfort of the bees within the hive, thus facilitating their work and increasing the spirit for work in the entire colony.

A prompt beginning in the first supers is extremely important in tiding a colony over this critical period. The colonies should be strong enough when the first supers are given to send a force of comb-builders into these supers large enough to fill them with bees. The brood-chamber should be almost completely filled with brood to the top-bars, so that there will be no rim of honey between. It is better if the foundation is fresh, so the bees will draw it out thruout the entire super before these newly made cells are really needed for the storage of nectar. When conditions are less favorable at least one bait comb should be used in the first super. When two-story colonies are reduced to a single story at the time of putting on the first comb-honey super, it is sometimes best to give each of these strong colonies two supers at the same time.

Effect of Crowding from Supers Back into Brood-Chamber.

After work is begun in the first super, if no other supers are given until the combs are built out, it should be noted that the space in the supers that can be occupied by bees is being reduced as the combs are drawn out, until finally there is only about one-fourth of an inch left between the comb and the separator, so that most of the bees are crowded out and must go back into the brood-chamber. This is almost sure to cause the colony to work less vigorously. The same thing happens if the bees are driven from the super because it is too hot or because the hive is not well ventilated. If the colony is strong enough to draw out the foundation uniformly in all of the sections, and the honey flow is promising, a second super should be given, even tho but little honey is stored in the first one.

In order to induce additional comb-builders to go up into the supers, this second super may be placed below the first one. If conditions are favorable, the foundation in the second super will be drawn out within a few days and these shallow cells can be used for the evaporation of the incoming nectar. The bees apparently enjoy spreading out the raw nectar, a little in each cell, thus hastening its ripening by increasing the surface of the nectar exposed to the air. Before much honey has been stored in the second super it may in turn be raised up and a third super given. This operation may be repeated as often as necessary to keep the bees busy drawing out foundation and to attract more and more of the younger bees from the brood-chamber into the supers. In order to hasten the completion of the first super that was given it may be placed immediately above the super in which the bees are drawing out foundation, while the other supers are arranged above it in the order that they were put on the hive, the one in which the least work has been done being placed on top.

If it were possible to foretell the number of supers that each colony would finish during the honey flow, it would be well to induce the bees to draw out the foundation and begin comb-building in that many supers as early in the honey flow as possible, then give an extra one to be placed on top as soon as the foundation is completely drawn, the purpose of this extra super being to contain the overflow of nectar during the process of ripening. This extra super, having served as an evaporating chamber this season, can then be taken off before the combs and sections become soiled with propolis and be given as the first super next year.

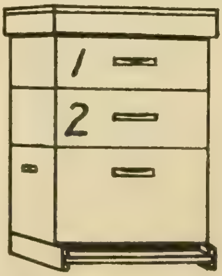


Fig 2.—Second super placed below the first.

When the New Super Should Be Added on Top.

Colonies that are not strong enough to send a large force of comb-builders into the first supers should not have their super room expanded so rapidly. A good rule to follow is to place the new super under those in which work has been started, provided the colony is strong enough, and the honey flow is good enough to cause the bees to draw out the foundation uniformly thruout the super. If they draw out only those in the middle of the super, the second super

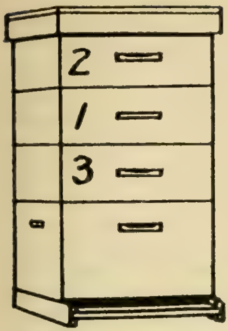


Fig. 3.—Third super placed below and first just above it.

should be placed on top at first, and no super should be raised up and another put under it until the foundation has been completely drawn in all of the sections. If the honey flow is slow or if the nectar is thicker when first gathered, the work of drawing out the foundation, comb-building, the ripening of nectar, and sealing the honey may all be done in a single super. In this case the newly added super should be placed on top.

The thing to keep in mind when adding supers is to avoid, on the one hand, too many unfinished sections by giving additional room too fast; and to avoid, on the other hand, the lack of stimulation which comes from newly added room for new work and an abundance of comb surface for ripening nectar. The surplus apartment, whether made up of one super or half a dozen supers, should have some fresh foundation being drawn until near the close of the honey flow. Rapid expansion of super work should take place during the early part of the honey flow, while during the latter part of the honey flow the super work should be concentrated.

During hot weather added ventilation may be given by pushing the first super forward on the brood-chamber about an inch. This will form an opening at the back of the hive just above the ends of the top-bars of the brood-frames. Such openings should not be made between the supers, since the bees may fail to finish the sections nearest such openings.

The beekeeper who by skillful supering is able to entice most of the rapidly oncoming younger bees into the supers early in their lives, and who keeps his colonies comfortable at all times, thereby increases his crop. With most of the younger bees in the supers and most of the older bees in the fields during the heat of the day, it would seem that each of field workers should make six or eight trips for nectar during the day instead of four.

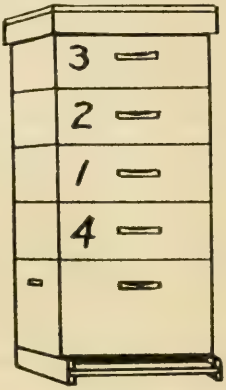


Fig. 4.—First super left in same position until finished.

CLASSIFYING THE QUEENS

Why Queen Breeders List Different Grades of Untested Queens. Variation in Tested Queens

By H. D. Murry

Some confusion seems to exist in the minds of beekeepers about the proper classification of queens — especially the untested queens. In the January issue of Gleanings in Bee Culture, page 44, George W. Moore says: "Many queen-breeders have lost my trade by listing two kinds of untested queens—the good and the bad." Since I read that quotation, I have had a letter from a friend, whom I know to be a well-informed beeman, expressing the same idea. As well informed as we all know the late Dr. Miller to have been, I recall more than one reference to this subject, and he admitted that the matter was not clear to his mind. I do not recall that any queen-breeder has ever attempted to make the matter clear. Perhaps they may be afraid to stir the matter up, as it may lead to more controversy than the best and busiest queen-breeders have time for. As I am, at least temporarily, out of the list of advertisers of queens, I am going to make the attempt. I have no ax to grind and nothing to lose.

Paying for good Looks.

The confusion seems to arise from the fact that the average beekeeper has *only* two kinds of untested queens in mind, untested and select untested, while the up-to-date queen-breeder recognizes three kinds, as they first appear in his queen-yard—untested, select untested, and culls. The culls get their heads pinched off, and, as he is not selling that kind, he does not list them in his advertisement.

Eliminating the culls, there remain the untested queens to classify. This is merely a matter of choice, and two queen-breeders might not make the same classification of the queens. One may be governed by what he believes to be the inclination of the average customer. For instance, there has been a tendency among beekeepers to keep the yellowest bees they could get. If the queen-breeder is catering to this tendency, he selects the yellowest queens to send out as select untested. If he is paying little or no attention to color, he merely selects the queens that present the best appearance, according to his idea as to what a perfect queen should look like. So it just comes down to the fact that the man who buys select untested queens is paying mostly for looks. The queens selected are not necessarily any better to head a colony run for honey than the ordinary untested queens. If the queen-breeder sold only the select untested queens and pinched off the heads of all the balance, it would make the price of queens prohibitive. For instance, suppose the queen-breeder has an order for six select untested queens. He goes into his queen-yard and out of a lot of probably 30 untested queens he selects six that come the nearest to looking like his ideal of a queen. Now, suppose he is selling untested queens at $2.00 each, and select untested at $2.25 each. By selling six at $2.25 each, $13.50, and the other 24 at $2.00 each, or $48.00, he realizes $61.50 for the lot of 30 queens. If he is always to kill all but the select queens, he must get as much for the six select queens as he should have realized for the 30 queens, or go out of the business of raising queens. I know that some queen-breeders claim they raise only select queens, but they will have to show me before I am convinced.

Classifying Tested Queens.

Passing on to tested queens, we find somewhat the same state of affairs. Suppose we examine a number of colonies and see what we find. We open the first hive and find the bees show three yellow bands. We decide at once that the queen is a purely mated Italian. Looking more closely we find many bees that do not show *all* the characteristic markings of the Italians. The third band is not very clear on some of them and some of the bees are small. The brood in the combs is not packed in closely, many cells remaining vacant. The force of bees seems to be running down, and, if the main harvest is on, they are not doing good work in the super. While this is a tested queen, she is not good, and we mark her hive for requeening at the first opportunity. She is a cull that has gotten by in introducing, or she may be an old and failing queen. In any event, she is not to be sold to anybody at any price.

The next hive opened shows the bees with all the characteristic markings of their race, the yellow bands about the same width on nearly all the bees. The combs are fairly well filled with brood, evenly placed, but showing a few vacant cells here and there. The colony is in a thrifty condition, and the prospect is that we shall get a fair average crop of surplus from it. Upon examining the queen, she may or may not show all the characteristic markings of the pure Italian. She may be a little off color, or possibly a little under the size of our ideal queen. But her work shows that she is a valuable queen to head a colony run for honey, so we may ship her out as a tested queen.

Select Tested Queens and Breeders.

The next hive opened shows bees with all the characteristic markings of their race. They are apparently of good size, and even color. The brood is closely packed in the combs, hardly a cell being left vacant, and the general condition of the colony shows they are prospering. The queen is large and fine looking, with all the characteristic markings of her race. The colony really may not be any more prosperous, or give promise of any better results in the super than the last colony examined; but on account of the better appearance of the queen, she is placed in the class from which breeders are selected, and we call her a select tested queen. Breeding queens are merely select tested queens that have been tried out as breeders and found satisfactory.

I hope I have made the matter clear. I am sure every conscientious queen-breeder will pretty nearly agree with me. If I have succeeded in making it clear to every one, we shall probably hear less about beheading all but one class of queens, for there really are two classes of both untested and tested queens; and the conscientious queen-breeder is trying his best to give each customer value received on every order, according to the class of queens ordered.

Callallen, Tex.

FROM THE FIELD OF EXPERIENCE

SIMPLIFIED QUEEN REARING

How Good Queens Can be Produced Even by Beginners

It is generally conceded that the commercial honey-producer should rear a part or all of his own queens. Many small beekeepers, however, do not believe it will pay to go to all the trouble to rear the few queens they need, preferring to let the bees do it. Now the beginner, if he is the enthusiastic amateur that he should be, is in the bee business for one of two reasons: he is in it for the love of the thing, or for the honey he expects to get. In either case he has a strong desire to learn the bee business, and he should remember that if he would understand bees he must study the queen. If one keeps bees for the pleasure derived from it, certain it is that the pleasure may be increased many-fold by studying and rearing queens. What greater delight can the amateur experience than to behold a beautiful queen all his own rearing. Dr. Miller used to say, ''Every one thinks the most of his own baby.'' This is doubly true if that ''baby'' be a queen.

The beginner who has but half a dozen colonies may not find it advisable to learn the grafting method unless he expects to keep more bees in the future. If that is the case, the sooner he begins to practice with the grafting method the better. However, there are many principles running thru all methods of queen-rearing that are similar; consequently if we learn one method, it will help us the better to learn another.

It is a well-known fact that queen-rearing during the swarming period is a very simple matter compared with rearing queens during a dearth of pasture. The swarming period is the time that the colonies are in prime condition for queen-rearing. It is this condition of the colonies that makes for success at queen-rearing, and not the fact that the bees have the swarming fever. I have found that if the conditions within the hive are made right, every bit as good results can be had in a colony that is not preparing to swarm as in one that is preparing to swarm. What are these conditions? The colony must be strong in bees, there must be a large proportion of young bees to act as nurses, there must be some surplus honey in the hive, there must be a large amount of brood in all stages, and there must be both nectar and pollen coming in from the fields. These conditions are right for swarming, and they are also right for rearing queens. The beginner should tackle the queen-rearing job when the conditions are the most favorable; so he should begin as soon in the spring as the colonies are in the condition described.

If the queen is removed from such a colony, the bees will construct queen-cells; and, if care is taken to select only the best cells, very good queens may be reared. This is a very simple method; but, as the bees often choose larvae too old for best results, it should not be used if a better one, that is not too complicated, can be used. A method that gives every whit as good queens as can be reared in any manner I will give in the following short article. In my earlier experience I used this, and I found it to give most excellent results. It combines two features that should appeal to the amateur; it is simple, and it gives the best of queens.

When the swarming season is at hand, go to the colony containing the best queen from which you wish to breed. In the center of the brood-nest place an empty comb. A new comb is preferable to an old one as the bees can work the wax much easier than they can in an old one. Leave this for two days, then examine it. If there are plenty of eggs in it, it is ready for use. If not, leave it another day. I prefer not to leave it more than three days, for we want to give this frame to bees for queen-rearing before any of the eggs are hatched. Assuming that there are plenty of eggs in the comb, we are ready to prepare a colony to build the cells. Go to a strong colony that has plenty of brood and bees. If their queen is a poor one, you can kill her. If she is a good one and you wish to save her, take a frame of brood and honey with the adhering bees and the queen, and put them into another hive. The nucleus thus formed may be built up to a full colony or it may be given back to the colony from which it was taken when we are thru using it for cell-building. After the queen has been removed, take out all frames that contain any brood or eggs. Brush off all the bees, then give this brood to weak colonies or to any colony desired so that it will be taken care of. This leaves the colony from which the brood was taken, both broodless and queenless. The bees should be left in this condition for two or three hours when the frame of eggs from the colony containing the breeding queen is placed in the center, and the remaining combs of honey and pollen are moved up close to it.

Let us now note the conditions brought about in this colony. A few hours before they were feeding a large number of larvae. They have now been without larvae for several hours, and the larval food has been accumulating so they are in a condition to feed larvae lavishly. They are also queenless and therefore in a condition to build queen-cells. They will at once begin to enlarge many of the worker-cells in order to make them over into queen-cells. Soon some of the eggs will begin to hatch and the young larvae will have the best of care from the many nurses that are there to care for them. In this manner they must choose larvae that have just hatched, and they feed them with an abundance of royal jelly so that the very best queens are reared. I have noticed in many cases the cells are enlarged before the egg is hatched, thus insuring that the young queen-to-be will receive an abundance of food.

In about 10 or 11 days from the day this comb was given to the cell-building colony, it should be removed and the cells taken care of. The cells should be cut out of the comb with a sharp knife. A circular hole about one and one-half inches in diameter should be cut so as not to injure the cell. If colonies are to be requeened, they should be made queenless at least 24 hours previous to this. Go to a queenless colony, cut a circular hole in the comb, and into it fit one of the cells you have just cut from the comb. These cells must be handled with care, or the young queen may be injured. The remainder of the cells may be disposed of in this manner if desired. Increase may be made at this time by dividing the colonies, and giving a cell to the queenless part. In a few days young queens should emerge and in seven or eight days more they will fly out to mate. One or two days later they should be laying. In this way you have reared some first-class queens, and just think of the fun you have had. Jay Smith.

Vincennes, Ind.

* * *

SAVE THESE WAX DIAMONDS

Simple Plan for Using the Splendid Queen Cells Built by Swarming Colonies

Because we have become dependent upon our southern queen-breeders in early spring is no reason why we should not rear some queens ourselves later in the season when conditions have become favorable for such work. As honey producers we have a better chance to select our breeding stock than the professional queen-breeder, and I believe it behooves us to improve this opportunity.

I will not speak of the manner or methods best suited to obtain well-nourished queens, but will only say that any honey producer who has sufficient time is not on his job if he does not make the best use of queen-cells which he may find in his most profitable colonies during the swarming season or when such colonies take it into their heads to supersede their queens. These are like diamonds to be picked up by the observant. If we should have the luck to find such queen-cells near the close of the honey season, there is perhaps no better way to utilize them than by removing old queens from other colonies and giving them these cells. This is the surest, the simplest, and the least expensive way to requeen and to introduce queens. Earlier in the season such a procedure would cost a portion of the honey crop; such a sacrifice we do not like to make, and I know of no short cut by which we may save valuable queen-cells in a very satisfactory way to me except by keeping them in nuclei.

One who has not all the necessary paraphernalia for queen-rearing may break up colonies that have cast a swarm several days previously and use them for this purpose. It may be possible to form as many little colonies from one mother colony as there are brood-combs, but I prefer to use two-comb nuclei. A queen-cell placed between two combs near the center will naturally be protected and kept warm. When the young queens have filled their two combs pretty well with brood, then is a very favorable time to transfer them to hives where requeening is desired.

Natural queen-cells built during the swarming season.

The introduction is very simple and not accompanied with any danger, provided it is to be done in the same yard. I just remove a comb with the old queen from the hive to be requeened and give one of the brood-combs, bees, and queen from the mating colony instead, making room for it at one side of the hive and being sure the new queen is on the side of the comb next to the side of the hive. Even when the requeened colony is a honey-storing colony, the work will go on uninterruptedly. The bees do not seem to notice the change. This would not be the case should we give just the cell. It goes without saying that the whole nucleus might be united with the colony to be requeened, and such a procedure would indeed be the one to be preferred if we have no further use for it.

When it is the plan to continue such nuclei, provision should have been made to have other queen-cells ready at this time. The comb from the requeened colony, be it a brood or a honey comb, then takes the place of the brood-comb removed from the nucleus; the cell is given in a protector, or 48 hours later without the protector. Thus several queens may be reared or mated from each nucleus. When queens thus reared are to be used in distant yards the introduction must be by a different method, or the same as is being practiced with queens shipped thru the mails. F. Greiner.

Naples, N. Y.

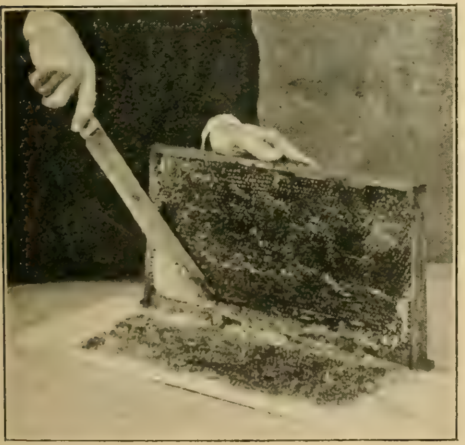
* * *

NEW KIND BULK COMB HONEY

Produced Without Destroying the Combs Which are Used Again

I was much interested in the description, page 28, January Gleanings, of the Bedell capping press, for the extensive beekeeper. I think it will prove a great labor-saver. I have another quite different plan which I have been using in a small way for several years, and which I have not seen advocated in Gleanings.

When extracting the "fat," thick, nice combs are set aside until enough of them are secured to make a special job of handling them. After trimming off the burrs and other objectionable parts with a sharp knife, cut the cappings along each end-bar on both sides, and along the top-bar on both sides. Then stand the frame, bottom up, on a broad board, with cleats nailed around the edges to hold any honey drippings. Then with a sharp knife cut right down beside the bottom-bar to the top-bar, inclining the frame so the thick slab of honey will fall over on the board, capping side down, cutting the comb as close to the foundation as is safe without cutting it. The frames are then set aside to drain until enough are secured to fill the extractor, when what honey remains is thrown out.



Slicing off slabs of honey to be sold as bulk comb honey. The thin comb or midrib is then put thru the extractor and returned to the bees to be refilled.

The slabs of honey are then cut up into squares of suitable size to handle with a pancake turner, when they are put into buckets, capping surface up. When the bucket is nearly full cover all with extracted honey, seal the bucket, and there you have several pounds of the finest comb honey ever produced. It has no tough midrib, or burrs as is often the case with section honey, and the canned slices retain all the delicate aroma of the comb. Of course it may be called a "mussy mess," but to my notion it is the finest-eating honey produced. My friends and neighbors never complain of its "mussiness" when presented with a sample for their tables.

Mentone, Ala. Dr. C. F. Parker.

* * *

MEETING THEIR WATERLOO

Black and Hybrid Bees Being Wiped Out in Pacific Northwest

There are two ranges of mountains between the coast line and the interior. The coast range of mountains divides the coast proper from the valleys that extend to the Cascade Mountains, and east of the Cascade Mountains lies the interior country—a vast empire largely given over to producing alfalfa, grain, and stock. The alfalfa regions support thousands of colonies of bees that produce honey by the carload. The climate west of the Cascade Range is more humid and equable, and as one approaches the coast humidity increases and the temperature is more even, extremes being rarely known. If it were not for the rain that generally prevails in the spring months, the coast counties and valleys clear to the Cascade Range would be ideal for bees, but weather conditions are such that sometimes bees cannot fly to advantage. When we do have a few days without rainfall, considerable supplies are gathered and colonies build up rapidly.

But here's the rub: Just as soon as brood-rearing commences in earnest we look for foul brood, and we generally find some,

FROM THE FIELD OF EXPERIENCE

Is the germ *here*, or is it an epidemic? We hear it is not so prevalent in the eastern part of the State with its drier climate. Can the humidity be an indirect agent or cause? There is no question as to the greater susceptibility of blacks to this trouble *here*.

Colonies purchased from outside districts may appear to have no disease when bought, yet after a few weeks they will show foul brood in a greater or less degree. Did they get it *here*, or was it purchased with them? It is certainly discouraging to those who buy blacks expecting to Italianize, to find on the arrival of the queens that a large portion of the brood is diseased, and what was a promising colony is now reduced to a nucleus. You can readily see where it places us at the beginning of the season, and what a handicap the bees have to overcome.

Now here is the question: If the infection is here for the blacks, why not for the Italians? Nearly all Italians are clean and healthy. Is it any wonder that whole districts are bee-less owing to the ravages of foul brood when the colonies were blacks, or hybrids, which are but little, if any, better? There is a great chance here for research work covering the cause and the source of the trouble. The use of Italian bees and of the very best is an imperative necessity. I find the good old three-banders are by far the best for *this* trouble, as well as for all other purposes. Our fond hope and only salvation are in the recent organization of county and state thru which we expect to teach better methods of beekeeping, and persuade beekeepers to Italianize. Unless we can do this thoroly in all districts, the case is hopeless. The wonder to me is they cannot themselves see the light, but when shown they acknowledge the difference between thine and mine. One instance brings this forcibly to mind:

A so-called beekeeper, who at one time was a successful producer, was taken to inspect his colonies that were scattered thru the hills along the Columbia River. Seventy-five per cent of them were found to be rotten—many dead, and not a single healthy colony. Bees were blacks, equipment was fair, but prospects nil! Owner couldn't tell how it happened, but called it bad luck. He now sees the light, for after leaving the horrible mess, with recommendation to burn, a visit was made to a real beekeeper and the poor man's eyes fairly bulged when shown colony after colony of three-banders boiling over with bees, with healthy brood, and encouraging prospects. This is a practical demonstration of real value, and one that counts. The lesson taught this man will never be forgotten, but this doesn't tell us how it comes, or why. E. J. Ladd.

Portland, Ore.

[Much is already known about *how* European foul brood comes. Robbing of infected colonies is a fruitful source of infection. Nurse bees from an infected colony, which have been feeding larvae and probably have been cleaning out dead larvae, may return to the wrong hive after a play-flight. The beekeeper may transpose combs containing the infection from a diseased colony to a healthy one. Honey in some cases may be the medium thru which the infection is carried, tho in European foul brood this is probably not an important source. When one stops to think of how many ways the infection may be transmitted he ceases to wonder why the disease sometimes spreads so rapidly, and begins to wonder why any colony in an infected apiary ever escapes. *Why* it comes has already been demonstrated again and again in widely scattered regions thruout the country. It comes because the colony that gets it is either not strong enough to clean out the infected material thoroly and keep it cleaned out, or because the bees for some reason are not inclined to clean it out. Some strains of bees are more energetic than others in cleaning out the dead larvae, and at certain seasons any strain of bees do a better job of cleaning than at others.

Strong colonies of Italian bees usually keep the combs free from dead larvae except sometimes during the period of heaviest brood-rearing in the spring. If a good honey flow comes on at this time, the bees at once become more active in cleaning out the infection. For this reason, in the region east of the Cascades, where heavy spring brood-rearing comes on later and is followed by the honey flow from alfalfa, the disease would naturally be less prevalent, since the honey flow stimulates the bees to clean house better at the time European foul brood would otherwise have been the worst.

In any region where there is a dearth of nectar, or adverse weather prevents the bees from working in the fields at the time European foul brood usually does the greatest damage, the disease may be expected to be bad, and it is apparently always worse when the colonies are weak.

Wherever European foul brood is present the beekeeper, in order to succeed, must make a greater effort than ever before to have his colonies abundantly strong during the critical period for this disease in the spring. For this reason many beekeepers, who have fought their way thru a siege of this disease, say that they are securing larger crops than before, because they now have stronger colonies at the beginning of the honey flow. Strong colonies of vigorous bees cure many other beekeeping ills besides that of European foul brood.—Editor.]

SIFTINGS

J. E. Crane

Go it, Bill Mellvir, you are on the right track. An extra peck of bees to the hive in June is an acquisition worthy of your efforts; but don't let that cow (May Gleanings, page 292) get those bundles of bills, for money is going to be very useful during the next two years.

* * *

Grace Allen gives us, on pages 286 and 287, a charming picture of the life of a colony of bees for a year, well worth the careful consideration of young beekeepers.

* * *

"Beware a Shortage of Stores," is the first editorial in Gleanings in Bee Culture for May, and stands out like a danger signal beside the road, or a great red buoy over a submerged rock.

* * *

One of the vexations of swarm control is looking up queens when the hive is full and running over with bees. By F. G. Rauchfuss' method this can be largely avoided. Thank you, Mr. Rauchfuss and Gleanings. This will save many a hard-worked beekeeper a backache in looking up queens, and be worth many times the cost of a bee journal for a year.

* * *

One thousand dollars for the honey from 23 colonies! Well, that looks pretty good. We hardly need to be told that O. O. Barton of South Dakota is a model beekeeper. Just look at that picture, page 291. Notice how erect every hive is. No covers askew, no weeds growing in front of them. "Straws tell which way the wind blows."

* * *

On page 281, T. V. Damon recommends hospital yards for bees under treatment for European foul brood. This is certainly desirable wherever circumstances favor; but where no convenient place can be secured, the queen should be caged or removed at once. This will stop brood-rearing immediately in every hive affected and, of course will keep the disease from spreading in that hive or to adjoining hives.

* * *

Much space is given in the May number of Gleanings to the best method of the prevention of swarming, or perhaps I should say for controlling it. This gives us time to go over the whole subject again before we are too busy to study it carefully. For securing surplus, I notice also increased emphasis is laid by standard writers on the value of double brood-chambers and of a large supply of honey early in the season.

Mr. Atwater, page 279, uses cleats to strengthen the top of his brood-chambers, and instead of hand-holes for the lifting of hives. We have used them for more than 50 years and can testify as to their value. He also recommends extra combs of honey for spring in building up strong colonies for the main honey flow.

* * *

A. I. Root, on page 302, introduces us to a new variety of annual sweet clover. Let them come. This shows the variable nature of this plant that in the hands of a skilful plant-breeder may become one of the most valuable of forage plants. I noticed a wide variation in the small lot of annual sweet clover I raised last year. This plant, as now grown, is quite imperfect. If, instead of one stem, it would throw out a large number of small branches near the ground, so as to be more acceptable to stock, it would add much to its value. Its leaves should be larger than it now produces.

* * *

Some years ago shaking a colony on to empty combs or foundation was highly recommended. We don't hear as much about it of late. Yet Mr. Demuth, in his excellent article on "Comb-honey Production," says on page 276, "In some cases taking away the brood, leaving most of the bees, the queen, and the supers together in the hive on the old stand as in hiving a natural swarm, gives best results." Again he says, "In other cases the queens should be removed or killed, all queen-cells destroyed, and the colony left until the tenth day when all queen-cells should again be destroyed and a young laying queen introduced." Now what makes the difference? We have practiced the former method for many years, and have found that it is somewhat difficult to succeed in shaking if you have an old or failing queen, or if the colony is just at the point of swarmng. Unless the colony is very strong the supers are liable to be vacated to some extent. If shaken on to foundation alone, they may desert the hive. A single comb, together with the frames of foundation, will usually satisfy the newly shaken swarm. We have found them liable to swarm out if even a little unsealed brood is given them; but several combs of honey or sealed brood can be given without tempting them to swarm out, and the emerging brood helps to keep up their strength. Under right conditions it certainly works well. If conditions are not right, it is better, as he says, to remove the queen.

HAPPY HOURS IN TEXAS

CONSTANCE ROOT BOYDEN

(Stancy Puerden)

WHEN we left the train in San Antonio early one morning in late March, after a warm and tiring trip from California, disappointing because we went thru the gorgeously colored desert portion at night, I had no idea I would be writing under the above heading a few weeks later. I was half sick, wholly heartsick at leaving California in "blossom time," and not a little homesick for our three children back in Ohio. One worries over her children even when her baby is 13 years old. But my personal conductor (let me abbreviate him into "p. c." hereafter in this article. He earned the title by whisking me around a five-thousand-mile loop in exactly 30 days, 9 of the nights and uncounted days in so-called sleeping cars.), disregarding my hints that he might as well leave me in a hospital while he transacted his business in San Antonio, took me to a dear old hotel near the Alamo. Having convinced the clerk, with some difficulty, that we must have a very airy and cool room, and having insisted that I eat some breakfast, my p. c. departed and left me to my own devices.

A refreshing bath followed by a soothing nap near three large, wide open windows drove away headache and exhaustion and presented the world as a delightful and interesting planet again. When your wife's temper shows room for improvement try that treatment on her, Mr. Subscriber. It is more effectual and agreeable than any bottled tonic.

At noon my p. c. returned and during lunch informed me that I was to go with a friend for a drive out to Medina Lake and that we must go early, as a storm was threatening. Soon after we started we came to a little river which winds wilfully thru the heart of San Antonio. Instead of the road crossing this river on a bridge in the conventional way, the river appeared to have the right of way and crossed the road, for our friend drove right down to the water and splashed into and thru it before I had time to more than gasp. I knew that horses could ford shallow streams but hadn't realized that automobiles were so accomplished.

Years ago there was a popular picture called "A Yard of Roses," and a companion picture, "A Yard of Pansies." My reason for betraying my age by the allusion is that I shall always remember that ride to Medina Lake as "Thirty Miles of Flowers." Our friend to whom I am indebted for the ride, B. I. Solomon of San Antonio, an ardent Texan, altho born in Florida, apparently inherited some of the wisdom of his namesake. He had previously told me he was going to keep us in San Antonio until I was ready to write on "My Texas" as I had written on "My California" a year ago, and then he started on that beautiful "Thirty Miles of Flowers" drive without a hint of what was in store for me.

Words cannot do justice to flowers, nor can pictures; but if an artist should make an attempt to paint the wild flowers of Texas he should have on his palette not only all the brilliant colors known, but should have the ability to mix the delicate pastel shades as well. Flowers were everywhere, growing at the side of the road, in the fields, on rocky hillsides and even in the trees. Imagine a field, its green background almost covered with graceful flowers of the purest deep blue, a rare color in flowers, much the shade of certain hardy larkspurs. Across the road and only a few feet from the blue flowers were great masses of flaming rose flowers, varying from salmon rose to a pure rose color with no yellow in it. The only cultivated flower which I can recall approaching it in brilliance is the flame-colored azalea. The blue flower was the Texas "bluebonnet," the State flower. It is the same lupine which grows in abundance in California, but it seemed to me the Texas lupine was more purely blue with no hint of purple in it. Another wise gentleman, H. B. Parks, a Gleanings correspondent and enthusiastic botanist, whom I met the next day, told me that the bluebonnet is not a honey plant but yields large stores of pollen at a time when it is much needed by the bees.

The flaming rose flower is commonly called the "Indian Paint Brush," and is similar to the bougainvillea because its true flower is tiny and inconspicuous, and it is the surrounding foliage which is so gorgeously colored.

Just to mention a few more of the most striking, there were pale yellow, primrose-like flowers with a black blotch in the center of each flower; yellow blossoms resembling marigolds, flowers of a delicate pink growing in large clusters; large, cup-shaped white flowers with buds in varying shades of pink, the same pink color sometimes showing on the under side of the petals of the fully opened flowers; cup-shaped flowers of a brilliant wine red; and bunches of blue flowers growing in a large shrub or tree, looking at a little distance like two-dollar bunches of violets all over the tree. On close examination these last named appeared more like the wistaria or locust in shape, and Mr. Parks told me it is known as the mountain laurel in Texas on account of its evergreen leaves.

There were many other wonderful flowering trees—the pink flowering acacia, the catsclaw; that wonderful honey plant, the mesquite; some which I shall not attempt to spell, and many more which I have forgotten. The mesquite is beautiful, its foliage much like the pepper tree of California, and the dark-green mistletoe, which frequently clings to it, contrasts beautifully with its light-green leaves.

I was much interested in a low-growing purple flower which seems abundant in every part of Texas, even on the desert. From its clusters and general habit of growth I was sure it was a cousin of the garden verbena, and Mr. Parks told me I was right. A pretty variety of dwarf phlox also grows wild in Texas.

MEDINA LAKE lies way back in the hills; and, as the road climbed higher, different varieties of flowers appeared, and the contrasting shades of the evergreen and various deciduous shrubs on the hillsides were beautiful. A mammoth irrigation project with immense dam has greatly enlarged the lake until it is now some 25 miles long, winding among the hills. The view of the lake and gorge from the top of the great dam was wonderful, altho Mr. Solomon was much disappointed because the approaching storm, which covered the sky with gray clouds, prevented me from seeing the lake in sunshine, when it is as blue as the Caribbean sea. My p. c. saw the water at its bluest last fall, and had conspired with Mr. Solomon to give me the treat; but he never saw the ''Thirty Miles of Flowers'' at their best, so I rather think we are even. On the way back Mr. Solomon obligingly stopped the machine at various points and gathered specimens of flowers until I had an armful of beauties, and the heavy storm caught us. Ordinarily I dislike to ride over macadam made slippery by rain, but a combination of chauffeur and roadster which can ford streams is not likely to skid, and we returned to my p. c. in good order.

AN equally delghtful drive, a few days later, was thru Brackenridge Park of San Antonio. The same little river beautifies this park, and miles of cool drives thru the trees make it an accessible playground. San Antonio, like so many towns thruout the West, by maintaining a public camping ground, shows a charming spirit of hospitality to motor tourists or home seekers traveling by wagon. In Brackenridge Park fuel, water, and lights are free to campers in a section reserved for their use.

But the best part of the park is where someone with a vision has transformed what must have been an eyesore into a beauty spot. We had been climbing rather steep grades, and Mr. Solomon was craftily calling my attention to various interesting features on the right when I happened to turn my head to the left, and there, way down below us, so far down it almost made one dizzy, was a beautiful sunken garden effect, miniature lakes, islands, and arching stone bridges, flowers, shrubbery, green grass and vines, rough steps hewn out of the rocky walls at the sides leading to pavilions with roofs thatched with palm leaves and supported by pillars of small stones, a sort of Japanese garden with a touch of the Spanish influence. It is charming now and with care will grow more beautiful from year to year, and just a short time ago it was nothing but an abandoned stone quarry.

When we were crossing the endless miles of desert country a few days before, I had been impressed with the strange formation of many of the hills. Loose, flat stones were piled one above another in such a way as to suggest towering retaining walls of masonry. It was hard to believe that they were not built by human hands. I'd love to go over that route with a wise geologist to explain the country, accompanied by my own p. c. also, of course.

To return to the park, much of the picturesque effect was obtained by the use of just such stones, used in a manner to suggest the way they appeared in the desert. For instance, the pillars which held the lights in the park and sunken garden were slender, pyramid-like columns of these stones, and the electric lights were cleverly hidden near the top. They were also used to construct the pillars supporting the palm-thatched roofs of the pavilions and in the bridges and dams.

And the flowers proved that the State which has such wonderful wild flowers can also grow most beautiful garden flowers. There was a great profusion of dwarf phlox, verbenas, and pansies in the greatest variety of rich colors, and I imagine summer flowers will be just as abundant later on. There were aquatic plants in the little lakes and fine shrubbery everywhere.

A few adobe Mexican houses near by, de luxe editions, you might say, gave one opportunity to buy pottery and curios and furnished ''local color.''' Mr. Solomon bought some tamales; but, in comparison with the delicious dinner which Mrs. Solomon had ready for us on our return, they seemed a little tasteless.

SOMEONE may wonder why I haven't used the title ''My Texas'' after an invitation to do so, which might be called a hospitable threat. I did intend to, and then it occurred to me it would be rather presuming to adopt the whole immense State when I have never stopped in any town in it except San Antonio, and my two visits there have been altogether too brief.

For several reasons the ''Happy Hours'' title is likely to fit any travel articles which come off my typewriter; I dearly love to

(Continued on page 382.)

Beekeeping as a Side Line

Grace Allen

With all the wealth of practical beekeeping literature available, it is unforgivable for anyone to start keeping bees without providing himself with either books or government bulletins or bee journals, or, better still, all three. Take the one matter of disease, for instance, to which unfortunately bees are subject; only the beekeeper who reads carefully (and watches his bees closely) can detect its early presence and know how to treat it.

One thing, however, that the new reader must try to avoid is the state of mind that cannot see the woods for the trees; where he becomes so lost in details that he fails to get a comprehensive view of the whole sequence. Before trying to master the many different systems practiced by the many different beekeepers in the many different localities, he should have in mind the general outline of the season's work. And it must be remembered that it is merely the march of the season itself and the natural activities of the bees themselves that determine this.

Beekeeping is far from being an exact science. There are some very definite (and some, alas! very indefinite) principles to guide the new sideline beekeeper. But there are no set, exact rules. The wise and beloved Dr. Miller made famous the axiom that bees do nothing invariably. And necessarily the success or failure of any method depends on the way the bees react to it. And the beekeeper, too; for one man succeeds better with one system and one with another. But anyone who has made himself familiar with the succession of main nectar-bearing flora in his locality, and who understands the seasonal development of a colony and its natural activities, has already much of the fundamental knowledge on which all beekeeping science and system has been built.

In this department last month, four outstanding phases of bee activity were mentioned, brood-rearing, nectar-gathering, swarming, and winter-clustering. The work of the beekeeper is to encourage brood rearing and nectar-gathering, to discourage swarming, and to make wintering as favorable as possible.

North of the Ohio River practically every beekeeper either puts his bees in a cellar or puts winter cases around his hives and packs them with several inches of chaff, shavings, dry leaves, or similar material (leaving, of course, entrances for air and an occasional flight of the bees). South of about the Ohio River latitude, cellaring is not practiced at all and packing by only a small number. But whether bees are wintered in cellars in winter cases, or left unprotected on their summer stands, winter is a severe time for them. So the first thing to do in the spring is to see how they have come thru,

Their great business now is brood-rearing. Thousands of young bees must be reared to take the place of the old ones that have lived thru the winter and are now dying off so fast, and to have the colony at its maximum when the main honey flow comes on. Every hive, therefore, must have a good queen, enough bees to care for the young, and ample stores to feed them.

If there is danger of their running short of stores, a rough estimate of this can be made, even before a general examination is advisable, by raising the back of each hive to get an idea of the weight. One of the lighter ones can be opened and quickly looked into, and its condition can serve as a guide in estimating the others. Those that are too light must be fed a syrup made of equal parts granulated sugar and boiling water. Put it in pans with tiny chips as floats; or in friction-top pails with tops perforated with tiny holes. In the evening just before dark, take the cover off the hive to be fed, set an empty super on, gently smoke the bees out of the way, and set the pan containing the warm syrup, or the inverted bucket, directly on the frames. Cover the hive carefully. Probably by the next night the pans or buckets will be empty, when they and the extra super should be removed.

The time generally accepted for the first regular examination is a warm spell during fruit bloom. It is a truism of the apiary that hives must not be looked thru, if avoidable, when there is no nectar-flow. For with no natural supply open, bees will quickly start pillaging any sweets exposed. In a remarkably short time such robbing may throw a whole yard into an uproar, an experience greatly to be dreaded. The wise and experienced beekeeper will wait, then, till there is enough nectar-bearing flora to claim their whole attention. Then he may make his examination in that gentle humming peace that seems both the inner heart and the outer garment of a beeyard.

One after another the hives should be examined at this time, to learn the general condition and especially to make sure each one has a queen; for sometimes queens die during the winter, and where there is a queenless colony there will soon be no colony at all. If any are found queenless, the easiest and probably the best thing to do is to unite such a one with a queenright colony. Do it this way: In the evening gently remove the cover from the queenright colony, lay a single thickness of newspaper over it; with equal care remove the queenless colony from its bottom-board and set it quietly on the other. In a few days it can be reduced to smaller hive space, if desired, by removing empty combs. Very weak colonies can be united the same way with strong ones.

It is not necessary to find the queen to know she is there. The presence of worker brood in various stages, including eggs, may be taken as a sign of a laying queen in the hive. (Worker brood is sealed flat, drone brood with rounded cappings.) But many beekeepers clip the queen's wings at this time, to prevent her going off with a swarm. It helps, too, in telling the age of the queen. Some clip the right wing one year and the left the next. Finding an unclipped queen in a hive, where there was one clipped, shows that the bees have superseded the old one. If one wants to find the queen, he should use as little smoke as possible and work quietly and gently.

As the main honey flow comes on, supers must be added. Indeed, the one great point to remember during the spring and early summer is to give plenty of room. This applies to both brood and honey. So if one uses a queen-excluder, he must see that there is room both above and below. There are many methods of handling bees at this time, but the one underlying thing to remember is plenty of room. The queen is laying rapidly; nectar is coming in rapidly, and, being very thin, must be spread out in many cells to be evaporated and ripened. See that full capacity of storage is granted every colony.

Often this one provision of plenty of room will prevent swarming. Often it will not. Swarm prevention is the greatest of apiarian problems. Swarms must be prevented if the full honey crop is to be secured. A great many beekeepers examine their brood-chambers every week during the swarming season, to look for evidence of swarming preparations. Others put their trust in large brood-chambers, some using a size considerably larger than standard, others using two standard bodies, both full depth, or one full depth and one shallow.

The sign of swarming preparations is the presence of queen-cells. If these long cells, meant to rear queens in, are just being started, they can be cut out and at the same time additional room be given, which may do away with the swarming desire; tho usually it will only give it a setback and will have to be repeated a week later. If the cells have advanced to the point of containing larvae, it will be necessary to do something more. The common practice then is to put a new brood-chamber with 10 empty combs on the bottom-board, exchanging one of these empty combs for a comb of brood with the queen (but no queen-cells), put the queen-excluder on, then one or two empty supers, and the old brood-chamber on top with all queen-cells destroyed. A week later this raised brood is again examined for queen-cells, which are again cut out. Thus are the bees kept together.

But if a swarm issues, and the queen is clipped, the first thing to do is to find her. She is usually outside the entrance, unable, of course, to fly. Secure her first; then quickly set the hive aside and put in its place one containing empty combs or full sheets of foundation. Soon the swarm will miss the queen and return. As they rush into this new hive on the old stand, the queen is released at the entrance and goes in with them. Any super on the old hive should be set on this new one, over a queen-excluder. That cares for the swarm. The parent hive can then be set on a new stand with all cells cut out, except one good sealed cell to produce the new queen.

If a swarm comes out with a queen not clipped, it can be secured when it clusters, shaken into a hive, and set where desired. There are almost an indefinite number of possibilities at this time, but these are the simple moves usually made.

Colonies must be kept strong at all times; only strong colonies roll in the honey, and only strong colonies keep out moths. Italian bees have been found particularly resistant to disease and free from moths. If one desires to Italianize a colony, or to requeen it for any reason, let him order a queen from some reliable breeder. When it arrives, he should find and kill the queen to be replaced, and introduce the new one according to directions on the shipping cage.

In removing the honey, after it is ripened and sealed, only the surplus, left after allowing from 30 to 50 pounds for the bees, should be taken. Extra supers may then be removed, piled in tight stacks, and treated twice, a week apart, with carbon bisulphide to protect them from moths.

Sometimes an adverse season, or an unwise beekeeper, will leave the bees without enough honey in the fall to take them thru the winter and on to fruit bloom, at least 30 pounds being required. What they lack must then be given them. This should be done in the evening, giving a warm syrup made of two parts granulated sugar thoroly dissolved in one part boiling water, allowing each colony as much sugar as it lacks honey.

Having made sure that each colony has a good queen (preferably young), plenty of bees, and 30 or more pounds of sealed stores, and having united any weak colonies with strong ones, as in the spring, one is ready for winter. Bees can be wintered in one full-depth body or in two, or in one full depth and one shallow; but the bulk of the stores must be in the upper story. Queen-excluders must be removed, and entrances should be contracted. And whosoever plans to pack, let him pack early.

FROM NORTH, EAST, WEST AND SOUTH

In Southern California. Prospects have gone from bad to worse, until it has become a serious question with many of us whether it will be wise to take any honey at all from the bees. Only a part of the colonies have stored in the supers, and those not so fortunate may need help to bring them thru the next winter. I am speakng of the orange as well as the sage and other unirrigated sections. The orange blossoms bid fair to yield nectar; but very unfavorable weather, together with the fact that the ground was very dry, cut the crop in many cases to almost a failure. Cold days and frosty nights prevailed much of the time during the orange bloom. Colonies of good strength at the beginning of the honey flow did not gain in numbers and were inclined to pack the brood-chamber with honey, and not go into the supers. The bees would hang out in front of the hives while the supers were empty—a thing almost unheard of in this part of the country. Only occasionally an apiary is found where there was any swarming to speak of.

The next thing for the migratory beekeeper to do is to move, but where is the question. Thousands of acres of land formerly planted to lima beans (a honey producer) has this year been planted to blackeye beans (a non-honey producer), grain, or other crop, thus very materially curtailing the range from that source.

I have been speaking in a general way. There are small sections of the country where there was more rainfall and where the beekeepers may get some honey. Or there may be a different variety of honey plants which bloom at a more favorable season. However, one cannot expect the big crops and good prices of the last few years to continue indefinitely. The fellow who can get his bees thru and have them ready for the honey flow every year is the one who will make a success of the business.

A fair sample of the newer type of beekeeper is here given. A professional man, whose son is a teacher, became interested in bees. The son soon did likewise. Last year they purchased odd lots of colonies, and together with their former holdings had nearly 100 colonies. These were on an orange location, and they made a good crop of honey. Last season being a very favorable one, about all a person had to do was to put on enough supers, and the bees soon filled them. This year these same men moved their bees to what is considered a good orange and sage range. After the orange flow, the older gentleman asked the man who had moved the bees to come and look over them and tell him what was the matter. He found that there was hardly as much honey in the hives as before he moved them. I had the same experience about 20 years ago, and the memory has stuck ever since. If the conditions and weather are not favorable, the bees will not produce the honey. In all lines of production we live in cycles and in order to equalize all things the game must be played from the beginning to the end, and not for one or two years only.

While honey still retails at a good price, there does not seem to be much demand. Comb honey is scarce and sells at from 25c to 40c per pound. Very few beekeepers in these parts produce comb honey any more, but the prospects for a good price for several years should encourage those who like it to produce it again.

This will be a good year to requeen the colonies which have dark or old queens. Much better results will be had if colonies which are drawing cells are fed once a day. There are so many different methods of raising cells that we will not go into detail here. Most beekeepers know how to graft cells and the conditions under which colonies will best build them. L. L. Andrews.

Corona, Calif.

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In Texas.—The beekeepers of Ellis County held their annual field meet on April 8 at the home of T. W. Burleson in Waxahachie. Beekeepers were present from three counties, and a very interesting program was carried out. Several colonies of bees were transferred, and the entire work of the pound-package operation, from the shaking of the bees into the packages to the building of colonies from the packages, was carried out in full. This was a very rare treat to the majority present, as they had never had the privilege of seeing bees prepared for shipment in combless packages.

The beekeepers of the Guadalupe Valley Beekeepers' Association held their annual field meet April 13 on the Guadalupe River near Seguin. Over 50 beekeepers were present. After a bountiful picnic dinner the beekeepers were addressed by Louis H. Scholl, editor of the Beekeepers Item, on present-day problems confronting the beekeeper; by E. G. LeStourgeon, on Market Conditions; by H. B. Parks, on Honey Plants; by Miss Alma Hasslbauer, on Beekeepers' Associations; by Mr. Alex, on Queen-rearing; and by Mr. Solomon, on Marketing of Apiary Products. The program closed with a question box, which brought out a number of quite interesting discussions. This association has been holding field meetings for five years, and this year because of the increase in interest among its members it will hold a second field meet in August.

Differences in locality were forcibly brought to mind the first part of the month during a visit to Dilley in Frio County,

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Texas. Dilley lies just 70 miles south and slightly west of San Antonio, and apparently has the same climatic conditions. However, at Dilley, there has been an unusual spring honey flow from huajilla and mesquite and other annual spring flowers. A great deal of honey has already been extracted, but here at San Antonio the cold winds and rain have put an end to the spring honey flow, and the bees are just making a living. The more one studies local conditions, the more vital the question of locality becomes. It is safe to predict that after a few years a beekeeper will be just as careful in selecting bee localities as peach-growers are in selecting locations for their orchards today.

The weather for the past month has been extremely discouraging to the beekeepers. The summer weather of January, February, and part of March caused the bees to build up very rapidly, and the honey plants were in excellent condition and promised a heavy honey flow. April has been very cold, and heavy rains have occurred. This put an end to brood-rearing in many sections, and in almost all parts of the State a large amount of chilled brood has been reported. The hope of an early honey flow is gone and in only a few localities are the bees in the best of shape. It has been said that the worst thing for a dry country is a rain, and this has proved true in southwest Texas. The rain put an end to the mesquite honey flow, and the huajilla has produced probably one-fourth of the normal crop. These conditions, which have entirely or partly done away with certain honey flows, will produce others which were despaired of. The horsemint is coming into bloom and promises to give a very good crop. The cold weather has been very adverse to queen-rearing and also to the combless package bees. Had it not been for the cold weather in the fall which caused buyers to ask a delay in the delivery of their orders, it would have been impossible for sellers of live bees to deliver their orders.

The active work of the Extension Division of A. and M. College in beekeeping is being shown in the interest taken in that subject in counties where beekeeping has been little known. D. T. Griswold, county demonstration agent for Denton County, has arranged a county demonstration exhibit to be held in May. One day will be beekeepers' day, and demonstrations in transferring and in the handling of bees will be given by R. R. Reppert, Extension Entomologist, who will have charge of this work.

San Antonio, Tex. H. B. Parks.

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In Ontario.—The season is unusually early here in Ontario, so far as spring bloom is concerned. Willows, fruit bloom, etc., are ahead of a year ago by three weeks. Clover is not correspondingly so far ahead, and this means a long period of dearth between fruit bloom and clover. This is a time that gives the apiarist a lot of work unless stores are in the hives in abundance. Colonies wintered outdoors, at least so far as our own apiaries are concerned, are almost universally heavy with stores.

Our 400 colonies wintered inside are just the opposite, altho the bees wintered indoors were fully as heavy last fall as those left outside. An exception to this rule is found in the 60 wintered here at home in the underground cellar where it was cooler and of more even temperature thru the winter than in the other two repositories—one above ground and the other in an ordinary cellar. Evidently in the two latter places the bees got too warm and did a lot of winter brood-rearing, sealed brood being in evidence in the hives when placed on summer stands.

Any change in the honey markets since last writing shows a tendency towards lower prices on the part of the wholesalers in an attempt to unload all stocks before the new crop comes on. Prospects, as stated in last issue, are none too good in many parts of the Province, so far as clover is concerned, but much better in western Ontario than in eastern parts.

As there have been different reports circulating about the net-weight law as recently amended at Ottawa, so far as it concerns honey containers, the following copy of letter from the Department of Health, Ottawa, should clear up matters. As is well known on this side of the "line" five and ten pound honey pails, as well as smaller sizes, are almost always sold by gross weight. The letter in question has been forwarded to me by one of the well-known pail manufacturers, with a request that I let as many know as I can, as the impression had gone out that all honey would have to be in net-weight pails this year. The letter follows:

"Gentlemen: Replying to your letter of the 11th instant, in connection with honey pails, I may say that, as the pails you showed me in this office designed to contain honey are not considered by us as sealed containers, the law in regard to statement of net weight on them does not apply.

"Yours truly,

"J. A. Amyot, Deputy Minister."

In view of the fact that many had already bought large quantities of gross-weight pails for the coming season, the above information will be very welcome indeed. The pails submitted to the office were of the "penny lever" type.

As some have wondered how the underground cellar showed up this past winter, the season is far enough on now to allow

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me to give a fair report. Bees went into the cellar under poor conditions as they had no flight for three weeks or more before going in. They were placed inside on the first week in December and taken out the first week in April. The cellar roof is of cement, quite dry when bees were put in, but reeking with moisture a week after. It was in that condition all winter, notwithstanding all that I could do in way of ventilating, altho the main ventilator was open most of the time. Water dripped from the roof of the cellar all winter forming pools on the floor.

The temperature was never above 46 degrees F., and never below 43 degrees F., even when the ventilator was wide open. The bees were heavy with good stores, and most of the colonies were clustered on the fronts of the hives all winter. The clusters had at least a pint of bees in each. This is an unusual condition so far as I can learn from others. We have had little experience in cellar wintering. But notwithstanding all the dampness, the bees wintered very nicely indeed, and are at present in good condition. Stores were not consumed very fast, and all are heavy at this date (May 10). I would never build a cellar with a cement roof again. I think that this same cellar, with roof over all covered with three feet of sawdust instead of six inches of cement and earth on top, would give better results and eliminate the moisture. Quite likely that will yet be done, that is, the earth be all taken off, large holes punched thru the cement top, then a roof built over all, and some three feet or more of sawdust piled over the cement|

As this is being written, we are just finishing preparations to move over 200 colonies of bees, with an immense amount of supplies, some 170 miles. Not a pleasant job but one that must be done; so I will "ring off" and get to work, with the promise of giving to the readers of Gleanings in some future issue, if I am spared, any pointers out of the usual order that we may come across in the trip.

Markham, Ont. J. L. Byer.

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In Pacific Northwest.— Horace Greeley once said, "Go west, young man." Apparently many young beekeepers and some old ones are following his suggestion, since the writer so frequently receives letters of inquiry about the possibilities of honey production in the Northwest. It is with the desire to set forth honestly a few of the opportunities and problems of the prospective beekeepers that the writer here gives some facts gleaned from his travels over the State of Washington, as special field agent for the Department of Agriculture.

Commercial honey production at present is confined largely to the irrigated sections of Yakima Valley where the principal sources of nectar are alfalfa and sweet clover. The most important hay-producing section, which is south and east of the little town of Parker and extending to about the county line, is quite well occupied by large honey producers. Most of the commercial holdings range from 100 to 500 colonies, while some three or four producers manage from 600 to nearly 1000 colonies. Annual averages range from 40 to 90 pounds. That portion of the Yakima Valley and the Wenatchee and Okanogan district are capable of supporting a few more commercial yards if properly located. However, one must avoid the fruit districts until there is some practical solution to the spray-poison problem. The Walla Walla district, which is under irrigation, is quite well occupied, but not overcrowded.

Second in present commercial production but first in possibilities and problems are the fireweed districts which include the burned-over timber sections west of the Cascade Mountains. Fireweed, or willow-herb (*Epilobium angustifolium*), is not very dependable as a honey plant except where there is considerable soil moisture. It is at its best in the section just mentioned, but is found growing in about every county of the State. It is adapted to both high and low altitudes. It is also at its best from about two to four years after a fire or until other vegetation begins to crowd it out. It blooms during July and August, and the beginning and ending of the flow vary with the elevation. The honey is water white, of mild flavor, and ideal for comb honey. It sells better on the market than alfalfa honey.

At present there are relatively few commercial beeyards of over 100 colonies. On the other hand, west of the Cascades, there is an exceptionally large number of small careless beekeepers with dark bees.

In a few localities on the west side clover is of importance. Beekeepers report that in the northern counties it does not yield nectar until July, while in the southern counties it yields in June.

Third in present production and third in promise is the northeastern section of the State where the following plants are more or less important: White clover, alsike clover, fireweed, and snowberry. There are almost no commercial apiaries.

There are many wideawake and progressive commercial beekeepers in the State, and they are rapidly coming together in State and local associations.

More detailed information relative to specific localities may be secured thru the Office of Bee Culture, Department of Agriculture, Washington, D. C., where the writer's geographical reports are on file.

Corvallis, Ore. H. A. Scullen.

HEADS OF GRAIN FROM DIFFERENT FIELDS

Stealing Eggs and Natural Selection. In the Feb. number of Gleanings Allen Latham criticises the conclusion of W. C. Davis (see the January issue) that a queenless colony stole an egg from which to rear a queen. His surmises seem more believable to me than Mr. Davis' explanation. Furthermore, the logic of his claim is good—that if an instinct were observed in any one case it would probably be common or universal. But what I wish to call attention to is the peculiar nature of that hypothetical instinct, for I can think of no other similar case.

Here is an instinct which would be very valuable to the race, and hence one that would seem liable to be developed by natural selection should it ever appear. On the other hand, its preservation by natural selection would be exceedingly difficult. In a way it is unique, for if a colony should steal an egg it would not be saving its own family but the **future family of another queen.** Let us suppose, for instance, that it was a colony of blacks that did the stealing, and that the stolen egg was that of an Italian queen. Altho the household (the colony) would go on, the family (the blacks themselves) would be replaced by yellows, and any inherited quality of the blacks, such as the egg-stealing instinct, would die with them.

The only conceivable way in which the prolongation of the life of the **colony** might enhance the chances of passing on a sporadic instinct, like the egg-stealing, would be the possible longer life, in an active colony as compared with a dying one, of the drones and the consequent increased chance of their mating and handing it down.

Absolutely the only way for that instinct to get a foothood would be for it to be bequeathed to a number of queen-daughters (as in the case of a ''Mendelian dominant'') which should settle in a restricted locality. In that case, when an egg was stolen it would be likely to be one bearing the instinct. If such a strain were built up, it would have a decided advantage over ordinary ones in that a queenless colony would not, as at present, be doomed. Such a fortunate strain might spread and, thru natural selection, supplant the old type.

I should not have said that this instinct was unique—there is (or rather, **could** be) one other of the same type, the instinct of a queenless colony to join a queen-right one.

Bethlehem, Pa. Robert W. Hall.

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Increase or Honey—Which? In Gleanings for August, 1920, page 489, E. J. Ladd gives an instance of one man who increased from 40 colonies to 75. These 75 colonies averaged 325 pounds of extracted honey each. We often have good figures like this from various sections of our country, but let us study Mr. Ladd's article a little. Would he have secured an average of 609 pounds for the 40 colonies, and would his profits all around have been one-half as much had he made no increase? We think not.

Had the original 40 colonies been run for honey alone, they probably would not have made more than a full-depth super of honey extra or about 385 pounds average for 40 colonies, as against an average of 325 pounds for 75 colonies, plus the value of the 35 colonies increase.

A long gradual honey flow is more suited to making increase, while a big short honey flow is better for honey production. We have many instances of those who produced a much greater surplus, more instances of an equal surplus, but by far the most instances of a reduced surplus after making increase. One should not increase beyond the amount of bees he can handle well; but, if increase is needed, it is economy to make some increase, even at a sacrifice of honey. In this connection J. J. Wilder says: ''Any beekeeper will find it best to split up his very strongest colonies, make two of each, run both right on thru the season for honey, and at the end of the season he has about doubled the amount that he would have obtained from the single colony, besides having the increase. The beekeeper who says his bees never get too strong perhaps has only one great honey flow, and it is only a few days in duration. Such being the case, he is right, of course, but such localities are rare.''

Point Caswell, N. C. C. E. Corbett.

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Smoking Crushed Bees. Referring to Morley Pettit's article on ''Colony Control'' in the April number of Gleanings another thing always making bees want to sting is the crushing of bees when a careless beekeeper is at work. Just one bee accidentally crushed will cause most of the other bees in the hive to elevate the abdomen, arching so as to show a bit of white petticoat between the segments near the tip. This is accompanied by a sullen buzzing and the darting forth, here and there, of bees on the war path. And if one of these darters gets a chance at the beekeeper she stings as tho she meant it. Moral: Don't crush any bees when opening the hive and removing combs. If a bee should be crushed in spite of you, try holding the nozzle of the smoker close to the contaminated area of glove or hive and giving a few strong puffs of smoke to neutralize the odor.

Ventura, Calif. Flora McIntyre.

HEADS OF GRAIN FROM DIFFERENT FIELDS

Fogs Affect Nectar Secretion in Sage. I read with interest about Elton Warner's locating his apiaries by the use of soil maps. In California I locate apiaries by closely watching the rainfall charts of the weather bureau; for, as a rule, the soil here is of a soft granite or sandy composition that doesn't hold moisture well if we have hot winds off the desert.

As a rule, these hot winds come about the time the sage is in bloom. Some years they come early enough to kill the orange bloom. I have seen the ground just brown under the orange trees from falling orange blossoms killed by one of these hot desert winds just as the honey flow started. There are some districts where these dry winds are more severe than others. The sage weevil has caused the beekeepers the loss of many a good honey crop, even after we have had good rains and the honey prospects were looking good.

As a rule, very little sage beyond or above the fog belt will be found giving surplus honey. The sage, like the lima bean, does best and produces the most honey in the fog districts. Owing to the fog, some years we have a fair yield of honey because the sun can't dry out the foliage of the honey plants. Many beekeepers then extract too closely, and along comes one of those hot desert winds and dries up everything. It also drives all the haze, smoke, and fog far out to sea. The sun then finishes what the wind didn't. A. E. Lusher.

Pomona, Calif.

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Sending Queens Long Distance. Living in a place where queens sent me by mail were often three weeks or even longer under way, I noticed that when several cages were sent me, tied together, that the queens in the outer cages were often dead while those in the inner cages were all right. I, therefore, requested the senders to place two empty cages outside those containing the queens, and with perfectly satisfactory results. An an extra precaution some moist cotton waste can be placed in the outside cages. It is likely that handling, heat, sunlight, etc., affect the outside cages more than the inner ones.

St. Thomas, Virgin Islands. Axel Holst.

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This Man Says They Don't. I think Allen Latham is right (see February Gleanings, page 99) in believing that there is always a queen present to lay the egg from which to grow a new queen. Last year I had a reason to move a strong colony to a new location. Some hours later I noticed many of the field bees returning to the old location. An extracting super, which had not been on a hive for six months, was placed there by me for the purpose of catching the field bees. They began to enter without hesitation; then to my surprise I noticed an old crippled queen crawling towards the hive. She was allowed to enter; but the next day she was missing, and a few days later I discovered two or three queen-cells, which in due time yielded a good queen. If I had not seen the old queen, I might have believd that the bees had stolen the eggs.

Fairfax, Iowa. C. F. Wieneke.

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Hiving Swarms on Foundation. If bees are hived on all foundation without a queen-excluder and the supers are transferred to the new hive, the queen is very likely to deposit eggs in the supers, even when sections are given. Pollen also will be found in many cells. A frame or two of empty comb will generally prevent all such trouble. Even if a queen-excluder is used, there will be some pollen in sections when no empty combs are used with the frames of foundation.

East Avon, N. Y. A. C. Gilbert.

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Why Drones Vary in Color. I have been much interested in a discussion going on in your magazine regarding the drones of Italian colonies. Last summer and fall I could not understand why all my drones bore such a close resemblance to enormous horse flies, almost blue with only occasionally a faint shadow of a golden band. Imagine my surprise on opening my hive this spring to find wandering over the frames drones which were almost orange-colored in their markings. They are very different-looking drones from any I found in my colony last year. Is it possible that the time of the year the drones are reared affects the golden bands? Or does the food or some other condition make the difference? They were all children of the same queen.

Freeport, N. Y. Magdalen Sproull.

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Hospital Yards. We got some very valuable information from our State inspector, Mr. Schweice, who met with us at our last meeting. Mr. Schweice is one of those pleasing fellows whose suggestions are always bright and up to the minute. One thing Mr. Schweice advised us to try, is a field hospital, equipped for handling foul brood, the expense of fitting up this hospital and its maintenance to be borne by the association. The members of our association fell for this

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idea with good cheer, and if their present feelings do not wane within the next two or three months the Churchill County Beekeepers' Association will have a well-equipped hospital far enough isolated from any apiary to eliminate all danger of contagion, where the beekeepers can properly treat their sick bees without endangering the lives of the healthy ones.

Churchill County, Nev. G. Russell.

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Nectar From First Crop of Alfalfa. Before the Roosevelt dam was built we had a dry winter around Phoenix, with but little rainfall. The alfalfa was stunted, and the blooms so short that the bees could reach the honey; therefore a good crop of honey and seed was produced from first crop. Our Buckeye valley was supplied with sufficient water from the underflow at the head of our canal system, so that our alfalfa was irrigated and was so rank that the bees got no honey from the blooms, and we received no seed nor honey from the first crop, but cut it for hay. Our second crop in the Buckeye valley, being produced at a time when it was warmer, with less irrigation water, yielded heavily in both honey and seed. Where water is plentiful many farmers ruin their seed and honey crop during the entire summer by over-irrigation, making the blooms so long that the bees cannot reach the honey. Red clover is the same way. B. A. Hadsell.

Maricopa County, Ariz.

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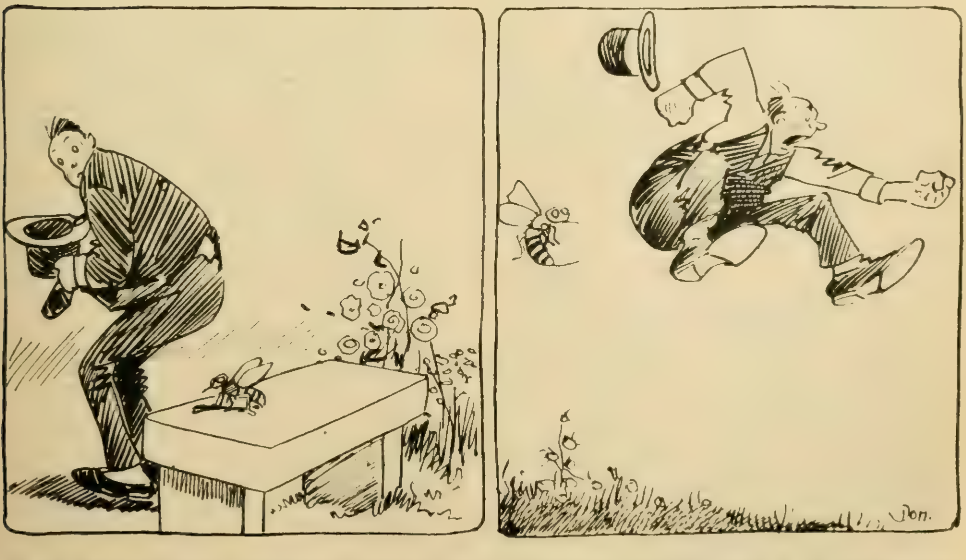
Religion and Business. It is sometimes said that religion and politics will not mix, and that religion and business do not go well together. It would seem as tho much depended on how they are mixed. After reading A. I. Root's experience with hotel prices of lodgings, page 754, I was reminded of a story I heard not long ago. A merchant wishing to exert a wholesome influence over his clerks told them that after every sale they should repeat a passage of Scripture. One day a woman came into the store inquiring for a certain kind of dress goods. A clerk showed her a sample that had sold for $2.00 per yard. She inquired if they would sell it for six dollars per yard. The clerk said they would, and completed the trade. The clerk reported his sale to the proprietor. "Did you repeat a passage of Scripture after the sale?" was asked. He certainly had. "What was it?" "She was a stranger and I took her in."

Middleburg, Vt. J. E. Crane.

A Reliable Formula for the Prevention of Stings.



At the Franklin County Beekeepers' convention held at Columbus April 14, Prof. J. H. Diebel of the Columbus schools, among other good things, gave this formula which, if followed to the letter, will absolutely prevent stings: First, do not sit down on a bee; second, do not let the bee sit down on you.

GLEANED BY ASKING

Geo. S. Demuth

QUESTION.—What is your opinion of using inch starters or half sheets of foundation in extracting supers?
Oscar Nelson.
Wisconsin.

Answer.—This is not advisable, because when only inch starters or half sheets of foundation are used in the supers, the bees build chiefly drone comb. When drone combs are used for extracting combs, if no queen-excluder is used, the queen usually lays drone eggs in them; and, if the queen-excluder is used to prevent this, the bees usually leave many cells vacant, apparently expecting the queen to come up to lay drone eggs in them. In extracted-honey production, at least, the first super given should contain worker combs, because it is usually desirable to permit the queen to have a free range thruout the hive early in the spring. Later, after the queen has been put below the excluder, drone comb is not so objectionable in extracting supers, especially if they are far enough above the brood-chamber so that the bees do not leave cells vacant.

DO QUEEN TRAPS HINDER WORK OF BEES?

Question.—Is it advisable to use the wire queen trap to put on the hive before swarming, or will it interfere too much with the coming and going of the bees?
W. R. Thorpe.
Ohio.

Answer.—If the queen trap is on the hive only during a week or ten days there will probably be no noticeable difference in the amount of honey gathered by the colony. Even when left longer it may not make much difference; but, of course, thoretically at least, the colony is better off without any obstruction over the entrance. Clipping the wings of the queen to a large extent accomplishes the same purpose as a queen trap; but, when swarms issue during the absence of the beekeeper, clipped queens are frequently lost by returning to the wrong hive or thru some other accident.

SWEET CLOVER IN WHITE CLOVER REGION.

Question.—Does the introduction of sweet clover into white clover territory reduce the quality of the honey gathered in this location?
F. E Poister.
Kansas.

Answer.—Much depends upon the preference of the individual who eats the honey. Some prefer straight white clover or white and alsike clover, while others may prefer a blend containing some sweet clover. Buyers are usually willing to pay a little more for straight white clover or white and alsike clover honey than for either straight sweet clover, or a mixture of sweet clover and white clover.

Sweet clover is apparently at its best as a honey plant outside of the best white clover territory. Immediately west and south of the region best suited to white and alsike clover and in the irrigated districts farther west, sweet clover is now furnishing large quantities of honey of excellent quality. Within the white clover district proper the introduction of sweet clover may result in honey from the two sources being mixed; but usually if white clover yields well there is but little if any mixing until near the close of the season, and the beekeeper can often extract this separately.

QUEENS MATED IN UPPER STORY.

Question.—Suppose I lift the back end of the cover at the close of the main honey flow and put a good ripe queen-cell in every super, would the young queen mate and go back into the super without swarming?
Jack Walterhouse.
Ontario.

Answer.—Yes, in many cases at least, especially if a frame of sealed brood is placed in the super when the ripe queen-cell is given, or shortly before. Soon after the close of the honey flow, however, these young queens may disappear, or the old queen below may disappear. When more is learned about the conditions necessary for the successful mating of queens in an upper story above a queen-excluder, while there is a queen in the brood-chamber below, it may become a useful method for requeening full colonies at the close of the main honey flow.

ITALIANIZING WITH VIRGIN QUEENS.

Question.—Would buying virgin queens give satisfaction where one wants Italian stock exclusively for honey production?
Iowa. Lawrence E. Molgard.

Answer. — The introduction of virgin queens of pure Italian stock would not result in pure Italian workers if the drones in your apiary and your neighbrhood are blacks and hybrids, for these virgin queens would, of course, mate with drones from your own vicinity. The drones from these mismated Italian queens would be pure Italians, however, and by requeening again with pure Italian virgin queens the following year, the chances of pure mating would be greatly increased. It is difficult, however, even for an experienced beekeeper, to introduce virgin queens that are more than three days old.

TREATMENT FOR SACBROOD.

Question.—Please tell me how to cure sacbrood. Will changing the queen help?
Virginia. Henry W. Weatherford.

Answer.—Sacbrood usually disappears during the season without treatment, especially if the colony is strong and has a vigorous queen. While this disease sometimes greatly weakens the colonies and may in severe cases even prevent them from storing surplus of honey, it is best simply to see that the afflicted colonies have plenty of stores at all times as well as a vigorous queen.

CONDITIONS FOR BUILDING WORKER COMB.

Question.—Under what conditions will bees best build worker combs? M. W. Millard.

Tennessee.

Answer.—If full sheets of foundation are not used, there are two conditions under which bees may be expected to build worker combs. (1) Very weak colonies having only two or three frames of brood can be induced to fill frame after frame with worker comb from inch starters only by removing all but two of their combs and giving them one frame at a time during the honey flow. The principle is useful in having combs repaired which have holes in them; for these nuclei will fill the holes with worker comb, while a larger colony would almost invariably fill the holes with drone comb. (2) Just after a swarm has been hived the bees will build worker comb for the first few days, unless the queen is old or failing. If only five or six frames containing inch starters are given to a newly hived swarm, the remaining space being filled with division-boards, a newly hived swarm having a queen not more than a year old, will usually fill these frames with worker comb; but, if more frames are given, the outside ones, and perhaps the ends of the middle ones, will contain drone comb.

When full sheets of foundation are used, better combs can usually be secured by having them built out in an upper story during a good honey flow.

ITALIANS AND EUROPEAN FOUL BROOD.

Question.—Do you consider that certain strains of Italian bees are really immune to European foul brood, or do you believe that the disease is eradicated by strong, vigorous colonies on account of their being able actually to carry all the infested material from the hive? D. D. Stacy.

Ohio.

Answer.—Italian bees are not immune to European foul brood, as may easily be demonstrated by placing combs containing this disease in a hive containing a weak colony of Italians. If the colony chosen is too weak to clean out the infested material thoroly, the disease will spread to other combs. Apparently strong colonies of Italians are able to overcome European foul brood by their thoroness in disposing of the dead larvae and pupae and cleaning out the cells. The two important factors in the eradication of European foul brood are a good strain of Italian bees and strong colonies, that is, strong in the spring.

QUEEN-EXCLUDER TO CONTROL SWARMING.

Question.—If I should place a queen-excluder underneath the brood-chamber and leave it there during the swarming season, what would be the result as to swarming? P. R. Morlan.

Indiana.

Answer.—After the prime swarm has issued and returned two or three times the bees would give up further swarming until the young queens begin to emerge a few days later. Then if none of the young queens succeed in escaping thru the queen-excluder, they would attempt to swarm every day or two until no unemerged young queens remain, and all but one of them have been killed. If the queen-excluder is not then removed to permit the surviving young queen to go out to mate, she would finally disappear, probably worried to death by the workers. The colony would then be hopelessly queenless. In the meantime such colonies, having the swarming fever thruout most of the honey flow and wasting much time in many unsuccessful attempts to swarm, would do little work in the supers. A queen-excluder can be used, as you suggest, to prevent an unclipped queen leading off a swarm while the owner is away, but to leave it in place thruout the swarming season would give very poor results.

ORIGIN OF BEE DISEASES.

Question.—In the April issue, page 203, you say the cause of the two most destructive brood diseases is positively known, the cause of American foul brood being a specific germ, *Bacillus larvae*, and the cause of European foul brood being an entirely different germ, *Bacillus pluton*. Now I ask what causes this germ? A. Beckard.

Missouri.

Answer.—The germs which cause the two brood diseases are minute plants, too small to be seen with the naked eye, but can be seen by means of a microscope. You are asking a hard one when you ask what causes these microscopic plants, or where they come from. No one knows any more about the origin of the microscopic plants than is known about the origin of any other plants. It is known, however, that it is impossible for a colony of bees to have American foul brood, unless some of the spores of the microscopic plant called *Bacillus larvae* are in some way carried into the hive and fed to the young brood. Likewise it is impossible for a colony of bees to have European foul brood unless some of the germs *Bacillus pluton* are in some way carried into the hive and fed to the young larvae. The disease is carried from colony to colony by robbing, by drifting bees, by the bees obtaining honey taken from diseased colonies, or by the beekeeper giving combs or other material from the hive of a diseased colony to a healthy colony.

UNITING SWARMS WITH ESTABLISHED COLONIES.

Question.—What do you think of hiving swarms (that one could buy) in with full colonies of bees to increase the population of the colony, thereby increasing the production of honey?

Iowa. M. E. Zbornik.

Answer.—Unless there is a good honey flow at the time, the bees of the two colonies may fight and many of them be killed when a swarm is hived in with an established colony, but sometimes this may be done without any fighting. Another objection to this plan is that, if the established colonies are already of normal strength, the addition of the swarm would probably result in these abnormally strong colonies immediately preparing to swarm. This plan might be used to strengthen colonies that are not strong enough to work in the supers, if conditions are favorable for uniting, but it should be used with caution.

TALKS TO BEGINNERS

Geo. S. Demuth

THE proper management of the bees during the active season depends so much upon the sources of nectar in the particular location that the beginner cannot manage his colonies intelligently unless he first learns when the honey flow may be expected. By consulting an experienced beekeeper of his neighborhood he may be able to obtain much valuable information concerning the chief honey plants of the locality and their time of blooming. He should also study carefully the list of honey plants mentioned in the standard books on beekeeping, for he should become acquainted with all of the more important honey plants of his locality and should know their relative importance as yielders of nectar. He will then be able to note the abundance of these plants this season and can watch their period of bloom to guide him in his management.

In some parts of the South the swarming season is already past and in many cases the early honey flow has already closed. Some localities in the South furnish later honey flows from which a surplus of honey may be expected. In fact, in many localities there may be a succession of honey flows from different sources, sometimes with an interval of a dearth of nectar between the honey flows; while in other localities these gaps may be closed, so the honey flow is continuous during a long period of time if conditions are favorable. In such cases the parent colony, as well as the swarm (see page 299, May issue), may be ready to store surplus honey during a later honey flow, and a super should be given to the parent colony as soon as it again becomes strong enough to need it, provided, of course, nectar is being gathered freely at that time.

In the North where swarming can usually be held back until the midst of the honey flow, the beginning of the main honey flow from white and alsike clover, which usually begins to yield some time in June, the parent hive usually does not need a super this season, for having been robbed of its field workers, which were added to the swarm as described last month, it usually recovers its strength too late to do much in the supers, unless the honey flow is unusually long. Sometimes, however, even in the North, these parent colonies will need supers three or four weeks after the swarm issued, if the honey flow continues.

Discouraging Swarming During Honey Flow.

In the North the beekeeper who has been able to coax his colonies thru the month of May without swarming, and also without running short of stores, has thus far managed well. By good management from now on he may be able to induce them to work ahead full speed thru the season without swarming in many cases, even when producing comb honey. This is done largely thru the management of the supers and keeping the colony comfortable. As soon as the honey flow begins, and sometimes even before, if the colonies are strong, the entrance should be opened to full size making it seven-eighths of an inch deep by the full width of the hive, and a wide shade board should be put on top of the hive to protect the supers from the direct rays of the sun. This board should rest upon cleats to form air space between itself and the cover and should project beyond the south side.

The first super should be given to each colony before the honey flow really begins. For extracted honey it should be given sometimes two or three weeks before the honey flow, but for comb honey it is usually given in the clover region about the time of the appearance of the first white clover blossoms in any great numbers. If weather conditions are favorable for nectar secretion from the clovers, the bees will probably be working in the first super thruout the North when this journal is mailed.

Tiering Up the Supers.

One of the most difficult problems for the beginner is the giving of additional supers during the honey flow at the right time and in the right place. Some seasons a single super will hold the entire surplus of honey and when this is the case it is better if no others are given. During other seasons it may require several supers to furnish room enough to hold all the surplus the bees can store during the season, and if they are not added as fast as needed, a large portion of the crop may be lost from want of room to contain it. Some seasons the honey may be stored so slowly that it may take the bees a month to fill one super, while during other seasons they may fill a super within a week, or even less. There is also a great difference between colonies of different strength. Even during a rapid honey flow it may take a weak colony a month to fill a super, while a strong colony can fill it within a week.

When the honey flow is slow or when the colony is weak, the bees usually begin work in the middle of the super, neglecting the outside portions. In comb honey supers, they may begin on a half dozen sections in the middle of the super, leaving the foundation untouched in the outside sections. Sometimes they even seal the sections of honey in the middle of the super before drawing out the foundation in the sections at the sides. In supers containing extracting combs they may begin on a few of the combs in the middle of the super, leaving the cells in the outer portions empty until some of the honey in the middle has been ripened and sealed.

When this condition is found a second super need not be given until the foundation is drawn out in the outer sections of the comb-honey supers, or until nectar is found in the outside combs of extracting supers, and the second super should be placed on top of the first one. This is the management for either weak colonies or a slow honey flow.

On the other hand, if the colonies are strong and the honey flow is heavy the bees should draw out the foundation in the outside sections soon after beginning to work in those in the middle of the comb-honey supers, and should put nectar in the outside combs of extracting supers within a few days after beginning to store in the middle combs. When they do this a second super should be placed under the first before much honey has been stored in the first super, provided the weather continues favorable and the flowers promise well.

Following the same rule, additional comb-honey supers should be given just as fast as the bees will draw out the foundation in all the sections thruout the super, and for extracted honey an additional super should be given in each case as soon as the bees begin to store the incoming nectar freely in the outside combs of the super.

For extracted honey it does not matter so much if the supers are not completely filled when the season closes, tho it is better to have the season's crop within a few well-filled supers than to have the same amount of honey scattered thruout many supers. For comb-honey production it is very important that the expansion of super room shall not be too rapid, for this may result in many unfinished or poorly filled sections. The rapidity by which the bees expand their super work can be regulated largely by the position of each newly added super, hence the rule is to place the empty super under those already on the hive if the bees are storing rapidly, and on top of those already on the hive if they are storing slowly.

It will be well for the beginner to look into the supers every few days to note the progress being made and at the same time watch the progress of the blooming period of the honey plants, for sometimes without warning the honey flow may suddenly either be greatly increased or greatly decreased. The beekeeper must be prepared any minute to shift his supers to suit the needs, especially if producing comb honey, to avoid loss either by too many unfinished or poorly filled sections or by failing to supply room fast enough so that the comb-building can keep ahead of the honey gatherers.

When an empty super is placed on top, if the bees begin to work in it promptly, it may then be placed below if the honey flow is good. When the empty super is placed below at first and the bees fail to begin work in it promptly, it should be transferred to the top.

In order that the more advanced ones shall be well filled and the honey sealed more promptly it is a good plan to place the one that is nearest completion second above the brood-chamber, with the others arranged above it in the order they were originally given, the lightest being on top. (See Figs. 1, 2, 3, 4, Page 346-7.) When arranged in this way, if the flowers should fail unexpectedly, or the weather conditions become adverse for nectar secretion, the newly added super should be taken from its position below the others and placed on top, to hasten the completion of those which are nearest full and to induce the bees to carry the unsealed honey from the newly added super (now on top) to better fill the others.

Taking Off Finished Honey.

If comb honey is being produced the supers should be taken off just as soon as the sections of honey are sealed, for if they are left longer the surface of the combs may become darkened. This is more liable to happen toward the close of the honey flow or during a slow honey flow when the bees usually varnish over the surface of the cappings with propolis. Unless the honey flow is rapid it is not best to leave the supers on until all of the sections are completely sealed, for before those in the corner are sealed those in the middle of the super may become discolored. It is not possible to tell when a super of sections is finished by looking in at the top; but by standing the super on end and looking in below to see if the cells near the bottom of the section are sealed, one can usually tell whether the super is ready to be taken off.

The completed or nearly completed supers may be taken from the bees either by means of a bee-escape or by driving most of the bees out by smoke. If the bee-escape is used, place the super to be removed on top of the other supers but having a bee-escape board (with the bee-escape in place) between. Be sure that the escape-board is put on with the flat surface down, so there will be a bee-space between the board and the bottom slats in the super, and see that there are no bits of comb on the lower part of the super which would close the opening in the bee-escape when put in place. Also be sure that the cover fits down in place snugly, so there can be no chance for bees to get in from the outside. From 12 to 24 hours later nearly all of the bees will have gone down, and the super then removed.

If the supers are to be removed by smoking the bees out, remove the cover quietly; then smoke just enough to start the bees running down. By sending a puff of smoke down thru each of the openings between the sections most of the bees can be driven out, provided they are kept on the move so they cannot stop to fill themselves with honey.

BEES, MEN AND THINGS

(You may find it here)

SOME years ago 50 per cent of my golden Italian queens were lost in mating, while only 90 per cent of the blacks or hybrids were lost. The mortality of the golden Italian queens is two to one of the hybrids or black queens, during winter. Seven years ago I bought a golden queen in southern Iowa from which I raised many queens. I have never known any of that particular strain to cast a swarm, or to contract foul brood. However, about 70 per cent of the queens would die the first winter. One undersized golden queen stayed with me three summers. During all that time I never knew her to lay a drone egg. Her eggs would all produce workers whether laid in drone comb or not. Did any one ever observe the like? In the spring of 1917, one of my colonies dwindled for the want of feed. I gave them some pound sections, in order to save the queen; they hardly covered three sections, but they built up rapidly, and gave me a surplus of 28 lbs.''—C. F. Wieneke, Linn County, Ia.

''There are only a few bees around here. Some of them are kept in grocery boxes, the frames made of lath, with no foundation. One man asked me how I killed my bees and asked me to look at his hives, which I did. He had three swarms which were kept in grocery boxes. I asked him about how much honey he thought was in the hives in which were the bees he wanted killed. He estimated not less than two gallons in each hive. I lifted on the hives. They had no supers, and I was sure that no two gallons was in them. I told him that I would give him the amount of honey that he thought was in the hives—clean, good-flavored honey, for the hives. He would not do it. He would rather kill the bees and squeeze the combs with the dead bees in them. I suppose he was afraid he would lose a few ounces of bad-flavored honey. I think his hives had no movable frames, and were not worth more than two gallons of honey. He had kept bees several years, and never got any honey. I wanted the bees, and thought it was a pity to kill the poor things. Box-hive beekeepers are funny things.''—Edwin J. Dahlquist, Chisago County, Minn.

''Inclosed find $1.00 for Miller Memorial Fund. I wish I could have made it more, but have had hard luck with my bees. They were never in finer condition than they were this spring. However, last week two of my neighbors sprayed their apple trees when in full bloom, and, as a consequence, fully two-thirds of my bees are dead. These farmers were told again and again not to spray while trees are in full bloom—that if they did, it would kill the bees; but it was of no use. It was a pitiful sight to see the bees roll out of the hives and die, and the ground in the bee-yard was literally covered with dead and dying bees. The damage to me, figured at the lowest, is 500, besides the loss of the honey crop.''—G. A. Barbisch Houston County, Minn.

One of my colonies swarmed on a very hot day and clustered on a tree. Realizing that I could not get a hive ready for an hour or so I immediately grabbed a large sack, climbed the tree, pulled the sack up over the limb and bees, and hived, or, rather, ''sacked'' the whole swarm. It was hot. I hung those bees in the woodhouse and worked away on the hives. An hour passed by, and then another. I had not thought of an airhole for the bees. When we finished the hive and frames two or three hours had gone by, and, to my surprise, when I turned down the sack in front of the hive most of the bees fell out, and there they lay, as dead as Hector. I had not thought the sack close enough to smother the bees, but that was exactly what happened. I lost the bees but gained the experience.—A. C. Kerley, Supt. of Schools, Burke County, N. C.

''On account of the bad weather, the conditions in the South are not near so good as they were a month ago. I left an overabundance of honey on the hives last year; but, on account of the early warm weather, the bees are dependent mostly on what they can gather, and I expect where the bees were not in as good condition as mine there has been considerable loss.''—J. M. Cutts, Maricopa County, Ala.

''Has the editor read those articles in the Farm and Home about sweet clover, and the favor it is gaining with farmers for soil improvement? I wish all beekeepers could read them, and realize what sweet clover may mean to the beekeeping industry.''—Chas. W. Reed, Kings County, N. Y.

''Altho I never had any experience with bees I found the queen easily today without a single sting. Clover is very thrifty, and all indications lead me to believe that the crop of honey will be large.''—Merle L. Walradt, Chautauqua County, N. Y.

''One thing I want to tell you is that we have not had any white clover for three years, but we have a grand prospect for it this coming year.''—Thos. McNallie, Jasper County, Mo.

''My annual white sweet clover is white with bloom, and the bees are working it.''—C. E. Smith, Caddo County, Okla.

JUST NEWS

Editors

A BEEKEEPERS' chautauqua and Field Meet is announced for August 15 to 20 at Chippewa Falls, Wisconsin. The Wisconsin State Beekeepers' Association will hold a meeting in conjunction with the Chautauqua on August 19. This will be the third annual Chautauqua held in Wisconsin, the two previous meetings being held on the grounds of the University of Wisconsin at Madison. These summer meetings have been well attended and greatly enjoyed by Wisconsin beekeepers, their success being largely a result of the energetic work of Professor H. F. Wilson and his associates.

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It is reported that the appropriation for the control of bee disease in Florida has been reduced to one-fourth the amount which was formerly available for this purpose. If this is true, it will be a serious handicap for this work in that State.

* * *

A fund of $4,000 has recently been appropriated by the legislature of Ontario for establishing a queen-rearing apiary, and additional funds are expected for its maintenance. The main purpose of the Ontario Government in establishing this queen-rearing apiary is to furnish Ontario beekeepers an improved stock of bees for the control of European foul brood.

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A. E. Lusher of Pomona, California, reports that some of the orange growers in parts of Southern California sprayed the orange trees while in full bloom this season, which has resulted in whole apiaries being rendered unfit for honey production by the loss of their field bees. This practice, if continued, will be a severe blow to the beekeeping interests of this region.

* * *

The annual short course in beekeeping at the Ontario Agricultural College will be held June 13 to 17. This course deals with the practical phases of beekeeping and is offered to all those desiring to gain experience along this line. It is expected that Geo. H. Rea of New York and Prof. Kindig of Michigan will assist in giving this course.

* * *

A bill was introduced in the Territorial Legislature of Hawaii for the purpose of preventing all persons from keeping bees who do not control the surrounding country from which the bees secure the nectar. Apparently the bill was intended to give to certain persons the exclusive use of the bee pasture in territory under their control. A later report states that the bill was defeated in the legislature.

Dr. E. F. Phillips, chairman of the Bureau of Research of the American Honey Producers' League, has named Dr. J. H. Merrill, Manhattan, Kan., and Prof. H. F. Wilson of Madison, Wis., as his committeemen: Clifford Muth, chairman of advertising committee, has named A. L. Boyden, Medina, O., Wesley Foster, Boulder, Colo., C. H. W. Weber, Cincinnati, O., Dr. Ernest Kohn, Grover Hill, O., as his committeemen.

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The early honey crop is reported to be almost a complete failure in portions of North Carolina, Virginia, and Maryland. Cold weather and continued rains occurred in this region just after the beginning of the honey flow.

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The Yazoo Delta Beekeepers' Association will hold a field meeting at the apiary of W. W. Worthington, Wayside, Mississippi, on June 15. This new association is a live one, having been formed purely for business reasons, their main projects being the marketing of honey and the eradication of bee diseases.

* * *

The spring report of beekeeping in Ontario arranged by Prof. F. Eric Millen, Provincial Apiarist, is made up of 375 reports from 49 counties and represents 19,473 colonies spring count. The report shows the crop prospects from fair to extra good. A winter loss of 2.3 per cent as compared with 21 per cent for last year and 50,367 pounds of honey still in the hands of the 375 producers reporting.

* * *

The Bee World, published by the Apis Club, Port Hill House, Benson, Oxon, England, has combined its numbers for October to April in a single journal, thus giving in one issue a vast amount of excellent material. The Apis Club has recently made a wonderful growth, now having 32 affiliated societies representing altogether an aggregate of more than 11,000 beekeepers. A. Z. Abushady is secretary of the Apis Club as well as editor of the Bee World.

* * *

The new Department of Agriculture which has been formed by a recent act of the State Legislature of Michigan will assume control of apiary inspection in that State on July 1. Of the 14 departments which have to do with inspection of various foods, animals, and plants of the State, four bureaus are to be formed. The work of apiary inspection will go under the Bureau of Plant Industry. This bureau will include, along with apiary inspection, the inspection of nurseries and two other minor projects.

OUR HOMES

A. I. ROOT

Go ye into all the world and preach the gospel to every creature.—MARK 16:15.

Thou shalt not kill.—EX. 20:13.

Shall not the Judge of all the earth do right?—GEN. 18:25.

A FEW days ago the closing part of an old hymn that I think I heard sung in my childhood some 75 years ago, came to mind. It was like this:

"The heathen in
his blindness
Bows down to
wood and
stone."

During the years that have elapsed since then, much has been done for the heathen, especially in the line of our first text; and these heathens we think of mostly as in foreign lands. But, oh dear me! some events of a recent date cause me to inquire if there are not some heathens right here in the United States that are afflicted with a more awful "blindness" than even those in the most remote parts of the face of the globe. And sadder still, the heathenish work that has been going on (*some* of it at least) has its origin away up near the head of our government. What I have especially in mind just now is the decision of Attorney-General Palmer when he declared that "beer is a medicine." Is it possible that he was ignorant of how this matter has been thrashed out in years past, and decisions reached by our physicians, and by the Pharmacopeia of the United States, that alcohol in its various forms is *worse* than useless as a medicine. And then in the same breath he suggests that *real beer* should be made especially for sick people, so that whenever any doctor in the United States decides that his patient needs beer he should give him a prescription. And then followed the "blind" and "heathenish" suggestion that to have it handy for "poor suffering humanity," it might be sold in our drugstores at the soft-drink stand.

The question now comes up, Was Mr. Palmer really *ignorant* of the work that has been growing and spreading ever since the Anti-Saloon League was started, and even before that? Is it possible that it was a surprise to him when a protest came not only from the doctors but from the drugstores? And while I write, the whole State of Ohio is made safe from this threatened catastrophe by legislation that effectually cuts off any such work as selling real strong bear to any individual who can persuade some doctor that beer—that is, the old-fashioned beer—is the thing he needs to make him well.

I might add that Mr. Palmer furthermore suggested that special breweries should go to work and make beer for "sick folks"—the very kind of beer that our whole nation supposed was effectually ruled out. And, if I am right, while I dictate these words one or more breweries are *under way* to make beer for sick people. Did Mr. Palmer really know no better than to make the above ruling just before he stepped out of office? Or is it possible that the great breweries and the liquor people, with millions of money, had something to do in the way of biasing his judgment?

In these Home papers I have had something to say about the good farmers who volunteered to give corn, free of charge, that they grew last year by their hard work. I think that at first I mentioned they had contributed twenty millions of bushels; but after the ball started rolling the amount went up to thirty, forty, and finally, fifty millions, and just now I do not know how much more. Why did they do it? My impression is that it came about because there are a good many people in this land of ours who begin to recognize what the dear Savior said about laying up treasures on earth where "thieves break thru and steal.") Well, it occurs to me even in these latter times do *still* "break thru and steal." Well, it occurs to me that these farmers decided it would not be a bad thing (when the price offered for their corn did not pay the price of growing), instead of holding it, to *give it* to the millions of starving Chinese or to those starving in other lands. It was getting time to prepare for another crop of corn. There is no room for it in their corncribs. So, instead of selling it at a ridiculous price, they decided to invest it in treasures in heaven where thieves *do not* break thru and steal. And just when I began to worry about getting the corn over to the Chinese, the railroads all came forward. Years ago we used to hear it said that "corporations have no souls." May the Lord be praised, however, that we have corporations in these latter times that do have souls; and I think that every railroad company in the United States came forward and volunteered, in consideration of the farmers giving their corn, that they would carry it to the sea coast free of charge. And the next thing on the program was to get it across the great water, where men, women, and children are starving. Right in this crisis our good old Uncle Samuel concluded it was about time for *him* to join in and also lay up *some* treasures in heaven. By the way, I wonder if the good farmers, railroad companies, and others connected in this wonderful example before the world, had not some time in their lives read that promise in Malachi where the old prophet challenges the people by saying, ''Prove me now herewith, saith the Lord of hosts, if I will not open unto you the windows of heaven, and pour out a blessing that there shall not be room enough to receive it.''

Now, what I have been telling you above is certainly an evidence that, even if there is here and there an example of heathenish blindness, there are thousands of evidences that the people of the United States, and I hope the world at large, are on the road to ''the kingdom of heaven'' that the dear Savior talked so much about when he was here with us.

What I have been telling you above is in the line of saving life. The awful war we have just passed thru was a work of destroying life. I have talked to you about the League of Nations and the work on foot to stop cutting people to pieces and destroying life as a method of settling differences. What about this armament business —building men-of-war that cost, a good friend of mine said, $25,000,000, and after they were made, having the sad spectacle of seeing them going on to the scrap-heap *without ever being used?* And the saddest part of it is that you and I have to be taxed to furnish these millions to make ships and machinery to destroy the lives that God gave.

Some wise woman belonging to the W. C. T. U. said a few days ago that the text, ''Thou shalt not kill,'' was going to be read, ''Thou shalt not make *implements* to kill.'' Some good man or woman has suggested that there is only one nation on earth that could successfully fight the United States, and that is England. And then somebody *else* said that after the way we worked together with England during the recent war a sort of brotherhood had been established that would effectually prevent for *all time* any more wars between America and England. These two countries in times past have suffered somewhat from strained relations as to which should be in the best shape in the way of naval equipment for invasion. With England and the United States united, since what has happened to Germany, there is no probability nor hardly a possibility that any nation on earth would presume to declare war against us. Well, while I was thinking of that old hymn about the heathen in their blindness I was wondering if it was not a little heathenish to keep on investing untold millions in preparation for some future war. May the Lord be praised that both America and England, and, I trust, other nations, have already cut down their appropriations for future armament.

Since I wrote that Home paper about remembering the Sabbath day to keep it holy, perhaps half a dozen kind friends have written that I overlooked the sad fact (?) that the greater part not only of the people of the United States but of the whole world were having Sunday on the wrong day. It should be Saturday instead of Sunday. Now please do not feel hurt, dear friends, if I suggest that these good people are also guilty of ''heathenish blindness'' in thinking that the world would be made better by having Sunday on Saturday. Those who have had Gleanings for the last 50 years will recall that about once in 10 or 15 years I have taken this matter up. Now, I think I am right, and I think the good people of the world will stand by me when I say this talk about the first day and the seventh day is all folly, and I hope to be able to prove it in a few words. To me it looks as if there were no first nor seventh day. The argument I bring forward and have urged for the last 40 years or more is briefly this: One or more islands of the sea were settled by people from two different directions, and both were exactly right in deciding what day was Sunday. But they had two different days. They could not do otherwise, and therefore it was impossible for them to decide which day was the first and which was the seventh. In fact, I have challenged our Advent friends on this during all these years, and I also called their attention to the fact that for many years no one ventured to rise up and reply in regard to the island argument. Finally one good woman said something like this:

''Mr. Root, were I over on that island where they can not decide as to the Sabbath, I would find out which side had the most followers, and then I would take the opposite.''

That is, she would make her decision by being contrary. Would that be Christian-like?

Well, now, here is something further: In my recent visit to Battle Creek, Mich., I took the liberty of saying to Dr. Kellogg that I could with all my heart approve of all their work except that one thing of thinking that the world would be benefited by putting everything out of joint and having Sunday on Saturday. Just now I can not remember the precise words Dr. Kellogg used; but they were something like this:

''Mr. Root, I forgot to tell you that *I* have backslidden, gone back, and have been for several years in favor of the day usually accepted as Sunday.''

I arose and took him by the hand and said:

''Doctor, can I say 'praise the Lord' for this news?''

He replied, ''Yes, Mr. Root, say 'praise the Lord' if you choose.''

It has long been a wonder to me that a man of such great skill and intelligence with such world-wide reputation, could continue to put himself ''out of joint'' with the rest of the Christian people of the whole wide world.

I told you I have had something like half a dozen letters; and these good friends have tried to influence me by quotations from the Scriptures. But I have not looked up their quotations. It would take a lot of time, and it would not make a particle of difference. I have looked them all up in years past. I can not for one moment believe that the dear Savior, or that the great God himself, would think of such a thing as asking or commanding us to indorse anything so idiotic as to change our present Sunday to Saturday. "Shall not the Judge of all the earth do right?" Every one of the ten commandments, and everything advocated by the dear Savior, has some plain, clear reason for its making the world better. Consider for a moment. There are just now millions of starving people in this world of ours. While the great work is going on of conveying the food to the hungry, and saving life, and while the nations of the earth are in a Christlike way meeting this tremendous problem, shall we stop to argue about what day of the week shall be Sunday, when it is an *utter impossibility* to have the same Sunday on the day and hour all over the face of this mighty earth.

May God abundantly bless what I have said in the effort to make mankind better; and whatever may be your own private belief and convictions, dear friends, may what I have said or tried to say not make things worse, instead of better, with *any* poor, struggling soul.

RUNNING CHICKENS THRU AN UNDERGROUND TUNNEL; SOMETHING ABOUT THE DASHEENS.

Around our Florida home, in the center of our group of poultry yards which I described and pictured some time ago, there was one yard that the chickens had scratched over and over and fertilized with their droppings until it was very rich, and I wanted to try it for a crop of potatoes; but in order to do so it was desirable to remove the chickens from their roosting house, where they had both food and water, so I took them off the roost at night and moved their feed tub and watering trough into another house. Well, that suited *me* all right, but not so with the biddies. They made me think of the old couplet,

> A woman convinced against her will
> Is of the same opinion still.

They showed by their actions that nothing would take the place of their old accustomed domicile. When they wanted water or feed they must have the old metal tub and dropping water; and when any one of the biddies was ready to lay she seemed almost frantic, and kept trying, by some hook or crook, to get back to the old place. But I could not think of any other way to accommodate the biddies and myself both, but by making an underground tunnel as shown in Fig. 1. I made it of old boards partly, and of one-inch poultry netting. You see if I made a *lane* such as they have on farms for horses and cattle I would have to open and close two gates when I wanted to cross said lane. Well, in this underground tunnel there is a spot where I wanted often to go back and forth. Here I made a little wooden bridge to walk over. A great big clump of dasheens at the left of the pictures hides this bridge. You will notice the gate near it, at the top of the cut. Would the chickens accept the tunnel? When I first introduced them to it I sprinkled corn along the runway, and they were delighted to get back to their old home. The hens cackled, the rooster crowed, and in a little while they would dart back and forth on a brisk run. Well, the tunnel accomplished another purpose that I did not count on, as has often happened with my experiments. There is a lot of stuff in the garden close by in the way of trimmings from lettuce, turnips, radishes, cabbage, and other stuff that the hens are very fond of. But if you throw loose leaves on the ground the chick-

The "biddies" in their underground runway.

The volunteer dasheen after the potatoes were dug, and which came up among the potatoes.

ens can not take off a bite, for the leaf must be fast on something. But as this stuff is dumped on the one-inch poultry netting, or up against it, they will greedily take every scrap of it by snipping off fragments just right to swallow. The thing worked to perfection all winter.

Let me say here that the best ration for chickens to make them lay I have ever found is small potatoes—too small to be sold even as seconds—mashed up while boiling hot, and mixed with middlings. We have 13 hens, *some* of them several years old. But 10 to 12 eggs a day is a common thing for them. We had all the eggs all winter that a family of three could use, and quite a few were sold at the grocery.

Fig. 2 gives you another glimpse of this poultry yard. After I had grown and sold a fine yield of Red Triumph potatoes, the dasheens came up as a volunteer crop. In fact, they were growing up among the potato vines long before the potatoes were fit to dig; and they had no cultivation except to avoid hurting them when digging. No dasheens had been grown on that special plot of ground, and so I can not really tell how they came there.

Fig. 3 gives another glimpse of a part of the same yard. A single clump of dasheens had been allowed to grow there for two or three years. I think I have told you I once got a heaping half-bushel of dasheen tubers from one hill. *This* one hill would certainly make a heaping *wheelbarrowful*. While the artist was taking the

One hill of dasheens that will probably give a heaping wheelbarrowful.

picture I reached in the clump and drew out a dasheen about the size of a quart fruit-jar. The women folks made a dasheen soup of the stalks and leaves from this tuber, and then they pared the tuber by some little work; and the paring, the cooks claim, is one objection to the dasheen. This big tuber was baked whole, keeping it in the oven a long time, and I had a slice of it for my dinner. I pronounced it away ahead of any Irish or sweet potatoes. In fact, it was more like a roasted chestnut than anything else I know of. It was not only the most delicious and nourishing of anything in the potato line, but I believe it was *almost* as delicious and appetizing as anything that God in his great goodness, to the children he loves, has furnished us for ''our daily bread.''

THE NEW ANNUAL SWEET CLOVER.

I have been thinking for some time that we need a shorter name for this new clover; and I was much pleased when I found that a new name had been adopted—''hubam.'' The ''hu'' comes Prof. Hughes, and the ''bam'' from Alabama, the place where it was first found. Well, just now a new feature of this new annual is being reported from different parts of the United States—mostly but not altogether from the States further south. If sown late in the season, and especially where the winter is mild, it will start up again in the spring. I kept sowing seed occasionally last summer—perhaps as late as July; and among the late-sown plants about a dozen have started up this spring. I give you a picture of one of them. Some of the plants that have started up show plainly there is no mistake about it, for the old stalks, sometimes nearly as large as a hoe-handle close to the ground, still have the hard dry woody stalk in the center of the clump. The mild winter here in Ohio probably has had something to do with it. But here is another thing:

A clump of "Hubam" clover that started up in the spring. Photographed May 9.*

Burbank and others have suggested that the plant shows a great disposition to sport. While some plants shoot straight up, others spread over the ground like a vine, and still others have peculiar characteristics. Burbank suggests that much can be done, probably, by developing special plants.

Below is a clipping indicating the great height and tremendous spread of a single plant that this clover may make.

HAS CLOVER THAT'S NINE FEET HIGH.

Ames, Iowa.—Clover 10 feet high has been grown by C. E. Honkomp of Ashton, Iowa, from seed discovered by accident by the Iowa State Agriculture College in 1916 and developed there for distribution. Another Iowan who grew clover from the same seed had stalks 9 feet tall, that had to be propped up to keep them from breaking with the weight of blossoms and bees.

Just think of it! one little clover *seed* in three or four months will produce a clover like the above. Now if the plant from one little seed will do so much, what may be expected from a plant, such as I have pictured, in place of the tiny seedling? I can not give credit to the source of the clipping, for none was given me.

By the way, we still have seed to give away to our subscribers; and I am glad to tell you we have a better supply than we have had heretofore, so we can give you a little more than the small pinch we have been sending out.

If you want a larger quantity of the seed, see advertisement of the Fields Seed Co., page 390.

THE ANNUAL SWEET CLOVER.

My first experience with growing the annual sweet clover began last April, when I purchased a package of seed from A. A. Berry's Seed Co., Clarinda, Iowa, from which the plant described a few lines below was raised. I mixed the seed with biennial sweet clover seed, and sowed in black waxy soil in the latter half of April. For some weeks after the seed came up I could not see any difference in the growth. But later the annual began to shoot up and make rapid growth over the biennial. One plant started blooming about Sept. 1, when it was 7 feet in height. On Sept. 13 I measured it again, and its height was 8½ feet. No manure or fertilizer was applied to the soil except a little lime. Oct. 18 I commenced clipping off the seed stems as they ripened; they averaged 6 to 9 inches in length. From Sept. 13 to Oct. 24 it was extremely dry; as a result the plant made very little growth, but had some bloom at this date, when I took some measurements of main stock and branches. The stock was 9 feet high, 1¼ inches in diameter at base of plant. It gave off 12 branches, the first at 4 feet 6 inches and the twelfth at 5 feet 10 inches. Every seed stem was well filled. It is a wonderful plant for hay pasture as well as for enriching the soil, by plowing under in July. But its greatest value to the beekeeper is in the late bee pasture. It is better than buckwheat, as it lasts longer and produces better honey. The bloom of the biennial is practically past before it begins, but its last bloom is a feast for the bees up to freezing weather. H. Zinn.

Pataskala, O., Nov. 15, 1920.

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*Another picture in next issue will show growth the plant makes in 30 days.

Classified Advertisements

Notices will be inserted in these classified columns for 30c per line. Advertisements intended for this department cannot be less than two lines, and you must say you want your advertisement in the classified column or we will not be responsible for errors. Copy should be received by 15th of preceding month to insure insertion.

REGULAR ADVERTISEMENTS DISCONTINUED IN GOOD STANDING.

(Temporary advertisers and advertisers of small lots, when discontinued, are not here listed. It is only regular advertisers of regular lines who are here listed when their advertisements are discontinued when they are in good standing.)

Bert Smith, W. L. Ritter, Gelser Bros., L. S. Griggs, W. E. Genthner, E. E. Lawrence, Dr. Chas. F. Briscoe, P. W. Stowell, B. F. Averill, R. Kramske, J. L. Leath, F. M. Morgan, A. R. Wilcox, A. J. Lemoine, Mrs. J. T. FitzSimon, Elevation Apiaries, Golden Star Apiaries, I. F. Miller, Schuyler Herschell Hall, R. V. Stearns, Marugg Co., O. S. Rexford, Baughn Stone, W. H. Laws, Van Wyngarden Bros., Weber Bros. Honey Co., Sheldon Mfg. Co., Mead Cycle Co., E. S. Robinson, Smith Typewriters Sales Co.

HONEY AND WAX FOR SALE.

FOR SALE—Honey in 5 and 60 pound cans.
Van Wyngarden Bros., Hebron, Ind.

FOR SALE—Fancy clover honey in 60-lb. cans.
Jos. Hanke, Port Washington, Wis.

FOR SALE—Choice clover-basswood blend honey in new 60-lb. cans. J. N. Harris, St. Louis, Mich.

FOR SALE—Choice clover extracted honey. State quantity wanted. J. D. Beals, Oto, Iowa.

FOR SALE—10 cases (120 lbs.) choice extracted clover honey at 15c per lb., f. o. b. Merritt.
J. H. Corwin, Merritt, Mich.

FOR SALE—Fine quality raspberry milkweed honey in 5-lb. and 10-lb. pails and 60-lb. cans.
P. W. Sowinski, Bellaire, Mich.

FOR SALE—2000 lbs. choice white clover extracted honey. State quantity wanted. Sample 20c, applied on first order. C. H. Hodgkin, Rochester, O.

FOR SALE—500 lbs. clover-basswood honey, 5-lb. pails, delivered, $1.00 pail. Special price on lot. One ton fall honey in 60-lb. cans. Quote best offer.
H. S. Ostrander, Mellenville, N. Y.

FOR SALE—Extracted clover honey, 15c per pound; amber and buckwheat, 12½c per pound; two 60-lb. cans to case. Amber in 50-gal. barrels, 10c per pound. H. G. Quirin, Bellevue, Ohio.

FOR SALE—Extra choice extracted white clover honey, put up in new 60-lb. cans and 5-lb. pails. Sample, 20c, same to apply on first order.
David Running, Filion, Mich.

FOR SALE—Clover, basswood or buckwheat honey, comb and extracted, by the case, ton, or carload. Let me supply your wants with this fine N. Y. State honey. C. B. Howard, Geneva, N. Y.

FOR SALE—White clover honey, almost water white. Put up in new 60-lb. tin cans, two to the case. Write for prices.
D. R. Townsend, Northstar, Mich.

FOR SALE—White honey in 60-lb. cans, sample and price on request. Also white clover comb, 24 sections to case. The A. I. Root Co., Inc., 23 Leonard St., New York City.

FOR SALE—Choice extracted honey in 5-lb. pails, 75c; 10-lb., $1.40; by the barrel of about 400 lbs., 10c per lb., f. o. b., Florida.
Ward Lamkin, Arcadia, Fla.

FOR SALE—Finest white clover extracted honey in 60-lb. cans. Price f. o. b. Holgate, Ohio. One can, $10.80, two cans, $20.00. 10 lbs. delivered to third postal zone, $2.50; 5 lbs., $1.25.
Noah Bordner, Holgate, Ohio.

FOR SALE—White honey, 15c a lb.; L. A. alfalfa, 14c, in two 60-lb. cans; Chilian in 165-lb. kegs, 10c; light amber honey in 50-gal. bbls., 80c a gal. Beeswax, 30c a lb.
Walter C. Morris, 105 Hudson St., New York City.

FOR SALE—Finest quality clover extracted honey in new 60-lb. tins at greatly reduced price to close out balance of 1920 crop. Say how much you can use and we will be pleased to quote you our lowest price. Address E. D. Townsend & Sons, Northstar, Mich.

HONEY FOR SALE—Immediate shipment f. o. b. N. Y., Calif. white orange, 60-lb. tins, 19c lb.; Calif. white sage, 60-lb. tins, 16c lb.; white sweet clover, 60-lb. tins, 14c lb.; Calif, L. A. sage, 60-lb. tins, 13c lb.; West Indian L. A., 60-lb. tins, 10c lb.; West Indian L. A., 10-lb. tins, 6 per case, 15c per lb. Hoffman & Hauck, Inc., Woodhaven, N. Y.

HONEY AND WAX WANTED.

BEESWAX WANTED—For manufacture into SUPERIOR FOUNDATION. (Weed Process.)
Superior Honey Co., Ogden, Utah.

BEESWAX wanted. Old combs (dry) and cappings for rendering. Also wax accepted in trade. Top market prices offered.
A. I. Root Co. of Iowa, Council Bluffs, Iowa.

WANTED—Shipments of old combs and cappings for rendering. We pay the highest cash and trade prices, charging but 5c a pound for wax rendered. The Fred W. Muth Co., Pearl and Walnut Sts., Cincinnati, O.

OLD COMBS WANTED—Our steam wax-presses will get every ounce of beeswax out of old combs, cappings, or slumgum. Send for our terms and our new 1921 catalog. We will buy your share of the wax for cash or will work it into foundation for you. Dadant & Sons, Hamilton, Illinois.

WANTED—Beeswax. We are paying 1 and 2c extra for choice yellow beeswax, and in exchange for supplies we can offer a still better price. Be sure your shipment bears your name and address, so we can identify it immediately upon arrival, and make prompt remittance.
The A. I. Root Co., Medina, Ohio.

FOR SALE.

HONEY LABELS—New designs. Catalog free.
Eastern Label Co., Clintonville, Conn.

FOR SALE—A full line of Root's goods at Root's prices. A. L. Healy, Mayaguez, Porto Rico.

ROOT'S goods at Root prices. A. W. Yates, 3 Chapman St., Hartford, Conn.

ROOT'S BEE SUPPLIES—For the Central Southwest Beekeepers. Beeswax wanted. Free catalog. Stiles Bee Supply Co., Stillwater, Okla.

BEEKEEPERS' SUPPLIES — Root's goods at factory prices. Send for 1921 catalog.
F. D. Manchester, Middlebury, Vt.

PORTER BEE-ESCAPES save honey, time, and money. Great labor-savers. For sale by all dealers in bee supplies. R. & E. C. Porter, Lewiston, Ill.

FOR SALE—200 new 10-frame Root hive-bodies with frames, all in flat. Were never uncrated. $340 takes the lot. Herbert Kietzer, Vernon Center, Minn.

FOR SALE—Hatch wax press, used three or four times, $12.00.
Ernest Ryant, Grosvenor Dale, Conn.

FOR SALE—"SUPERIOR" FOUNDATION, "quality unexcelled." Let us prove it. Order now.
Superior Honey Co., Ogden, Utah.

FOR SALE or on shares, 14 apiaries, one or all. Healthful location with American school and church in town, on stone road. Last crop over 40 tons. M. C. Engle, Herradura, Cuba.

FOR SALE — Good second-hand double-deck comb-honey shipping cases for 4¼ x 4¼ x 1⅞ sections, 25c per case, f. o. b., Cincinnati. C. H. W. Weber & Co, 2146 Central Ave., Cincinnati, Ohio.

QUICK queen-cager. Will run a queen in a cage in 10 seconds and not fumble her. 50c postpaid. Patent applied for. F. R. Davis, 203 Oak St., Weehawken, N. J.

FOR SALE—70 4¼ x 1⅞ beeway section-holders and slat separators, some used one year, some new. Mondeng make, $3.75. Woodman section fixer, good as new, $4.00. No disease. Irvin Nordgaard, Peterson, R. D. No. 1, Minn.

FOR SALE—Comb honey supers, complete, except sections, $1.00 each in lots of five; 10-frame for 4¼ x 1⅞ sections. Also a few used 8-frame hives in good condition at a bargain.
Ross B. Scott, LaGrange, Ind.

FOR SALE—Good second-hand empty 60-lb. honey cans, two cans to the case, at 60c per case f. o. b. Cincinnati. Terms, cash with order. C. H. W. Weber & Co., 2146 Central Ave., Cincinnati, Ohio.

FOR SALE—700 A grade 4 x 5 x 1½ plain sections, $11.00; 300 P fences for 4¼ x 4¼ plain sections, a few of which are slightly discolored by exposure to air, $16.00.
Miss E. J. King, McArthur, Ohio.

FOR SALE—90 twin-mating boxes, $75.00, f. o. b., Macon, Miss. These are first class, nailed, painted, and complete except foundation. No disease. Small frames, three of which fit in one Langstroth frame. Geo. A. Hummer & Sons, Prairie Point, Miss.

FOR SALE—Danzenbaker supers for 4x5x1⅜ sections complete with section holders and fences. For use on ten-frame hives. 15 nailed and painted and never used, 33 used two seasons but in good shape. No disease about. Will sell all crated for shipment at $1.50 each.
Miss E. J. King, McArthur, O.

FOR SALE—Owner wants use of outside warehouse. We must vacate and offer for quick sale. One-story 8-frame single-wall hives, per package of 5, $15.00; 10-frame size, $17.50. Staple-spaced frames, per package of 100, $9.00. 4 x 5 shipping cases with glass, per package of 25, $15.00. Goods first-class. Offer good only as long as this stock lasts. A. G. Woodman Co., Grand Rapids, Mich.

FOR SALE—45 10-frame hive-bodies, with Hoffman frames, new, wired and foundation imbedded. $2.00 each; 35 10-frame hives, complete, NEW galvanized covers, $2.00 each; 35 8-frame hives, air-spaced hives, "not new," with drawn worker combs, $2.00 each; 30 10-frame hive-bodies with frames nailed and painted, "NEW goods," $1.50 each; 25 comb honey supers, 75c each; 30 feeders, 10c each. Standard supplies. First class in every way. No foul brood combs. Most of these supplies never been on the hive. Reason for selling, going in other business. "This is a big bargain." W. J. D'Alliard, "Glenville Apiary," Amsterdam, R. F. D. No. 5, N. Y.

FOR SALE—One No. 18 Cowan reversible extractor with brake, new, has never extracted one pound of honey, $35.00; 25 10-frame Excelsior covers used but in good condition, 60c each, or the lot for $12.00; 25 10-frame comb-honey supers for 4 x 5 x 1⅜ sections, used, in good condition, all painted, $1.00 each, the lot for $20.00. Lynn Z. Silsbee, 20 Leonard St., Dansville, N. Y.

FOR SALE—50 Jumbo hives and 30 standard hives with metal and inner cover and reversible bottom at $2.00 each; 60 extracting supers for frames 6¼ in. deep at 50c each; 12 of each, 4¼ x 4¼ and 4 x 5 comb honey supers empty at 40c each; 12 4¼ x 4¼ comb honey supers with holders and separators at 75c each. All 10-frame size nailed and painted and in A1 shape, nothing over two years old. No frames or bees.
A. H. Hattendorf, Ocheyedan, Iowa.

BIG BARGAIN IN SECTIONS—We have an odd lot stock A and B grade sections not manufactured for our regular trade, size 4¼ x 4¼ x 1⅞. They compare quite favorably with Root Quality sections. We recommend both the A and B grades as a bargain. The A grade is strictly fine, and the B grade is quite as good except for color and imperfection. Stock limited and we urge quick action. A grade in crates of 500 at $7.65; B grade at $7.50. Available only in crates of 500. The A. I. Root Company, 224-230 W. Huron St., Chicago.

AUTOMOBILE REPAIRS

AUTOMOBILE owners should subscribe for the AUTOMOBILE DEALER AND REPAIRER; 150-page illustrated monthly devoted exclusively to the care and repair of the car. The only magazine in the world devoted to the practical side of motoring. The "Trouble Department" contains five pages of numbered questions each month from car owners and repairmen which are answered by experts on gasoline engine repairs. $1.50 per year. 15 cents per copy. Postals not answered. Charles D. Sherman, 107 Highland Court, Hartford, Conn.

WANTS AND EXCHANGES.

WANTED—Old combs and cappings for rendering on shares. Our steam equipment secures all the wax. Superior Honey Co., Ogden, Utah.

WANTED—To quote special prices on queen cages in quantity lots, to breeders. State quantity wanted. A. G. Woodman Co., Grand Rapids, Mich.

WANTED—Cowan extractor, pay cash. 100 Langstroth frames, $6.50, incubators, one-fourth price, exchange for gun.
Lorenzo Clarke, Winona, Minn.

MISCELLANEOUS

FOR SALE—New annual white sweet clover plants, 4 to 6 in. tall, 3 doz. for $1.00, prepaid.
C. S. Rhea, Hardyville, Ky.

FOR SALE—400 bushels buckwheat, $1.60 per bushel. New grain bags, 30c extra.
Albert Bues, Wharton, Ohio.

FOR SALE—25,000 pounds of scrap candy, 2½c per pound in barrel lots, about 200 pounds per barrel. Sterling Products Company, Evansville, Ind.

FOR SALE—1½-H. P. gasoline engine, good condition. Have windmill now. Price, $25.00, f. o. b., Coggon, Iowa. Edw. C. Heldt, R. D. No. 1, Ryan, Iowa.

SWEET CLOVER—Biennial yellow. Ideal for bee pasturage and soil improvement. New seed, recleaned and graded, unhulled, 8c per lb.
R. M. Hanna, Skillman, N. J.

HONEY, ROOTS, FURS—Beemen, why not increase your profits? A 32-page booklet describing books on Bee Hunting, Medicinal Root Growing, Fur Farming, Tanning, Trapping, etc., free.
A. R. Harding, Publisher, Columbus, Ohio.

FOR SALE—One Marlin 30-30 rifle, with telescope sights, $30.00; one K. W. Master vibrator for Ford cars, $5.00; one small Kelsey hand printing press, $5.00; one Ever-Ready Ford starting and lighting outfit, $30.00.
E. E. Lawrence, Doniphan, Mo.

SWEET clover combined huller and scarifier for hand use, one extra set of lining and two screens included, each $3.75, postage extra. Brass dropping tubes with tin funnel drop all kinds of small seeds on exact spot in windy weather without bending your back. Each, $1.00 postpaid.
S. Rouse, Ludlow, R. D. No. 2, Ky.

BEES AND QUEENS.

FINEST Italian queens. Send for booklet and price list. Jay Smith, R. D. No. 3, Vincennes, Ind.

SEE our large advertisement on page 386.
J. L. St. Romain, Hamburg, La.

WHEN it's GOLDEN, it's PHELPS. C. W. PHELPS & SON, Binghamton, N. Y.

FOR SALE—Italian queens and nuclei.
B. F. Kindig, E. Lansing, Mich.

PACKAGE BEES—Dependable Italian queens.
E. A. Harris, Albany, Ala.

HARDY Italian queens, $1.00 each.
W. G. Lauver, Middletown, Pa.

GOLDEN Italian queens, untested, $1.50 each; dozen, $14.00. E. A. Simmons, Greenville, Ala.

THAGARD ITALIAN QUEENS—See display advertisement elsewhere.

SIMMON'S ITALIAN QUEENS, bees and nuclei. Fairmount Apiary, Livingston, N. Y.

NOTICE—I am still in the queen business and solicit your orders. J. B. Marshall, Big Bend, La.

SEE our large advertisement on page 381 for prices. Buckeye Bee Co., Justus, Ohio.

PHELPS' GOLDEN QUEENS will please you. Mated, $2.00. C. W. Phelps & Son, Binghamton, N. Y.

BEES FOR SALE—50 select hives, absolutely healthy and in strong condition, $12.50 per hive.
The Fred W. Muth Co., Cincinnati, Ohio.

MY famous Italian queens. June 1 and later, $1.50 each, six for $8.00. J. W. Romberger, Apiarian, 3113 Locust St., St. Joseph, Mo.

IF you want queens that will produce results, give THAGARD'S ITALIAN QUEENS a trial.
V. R. Thagard, Greenville, Ala.

FOR SALE—Bright Italian queens, $1.50 each; $14.00 per doz. Ready after April 15.
T. J. Talley, Greenville, R. D. No. 3, Ala.

FOR SALE—Golden or three-banded virgins, 60c each, or $6.00 per dozen. Safe arrival.
R. O. Cox, Luverne, Ala., R. D. No. 4.

BEES AND QUEENS from my Carolina apiaries—progeny of my famous Porto Rican pedigreed-breeding stock. Elton Warner, Asheville, N. C.

PACKAGE BEES and PURE ITALIAN QUEENS. Booking orders now for spring delivery. Circular free.
J. E. Wing, 155 Schiele Ave., San Jose, Calif.

SELECT QUEENS only. Three-banded and leather-colored Italians. Tested, $2.50; untested, $1.50 each. Geo. W. Coltrin & Son, Mathis, Texas.

ITALIAN BEES in 8-frame hives and considerable extracting equipment for sale. No disease. Write wants. L. Mege, Pequannock, N. J.

FOR SALE—Golden Italian queens, 1 untested queen, $1.50; 1 tested queen, $3.00.
J. F. Michael, Winchester, Ind.

THAGARD'S ITALIAN QUEENS produce workers that fill the supers quick.
V. R. Thagard, Greenville, Ala.

FOR SALE—A few choice queens shipped in frame brood, $4.00 each.
Jes Dalton, Bordelonville, La.

CHOICE ITALIAN QUEENS—Three-banded and leather-colored. Tested, $2.50; untested, $1.50 each. Geo. W. Coltrin & Son, Mathis, Texas.

FOR SALE—Golden queens, untested, $1.15; 6 or more, $1.10 each; select untested, $1.60; 6 or more, $1.50 each; safe arrival. Hazel V. Bonkemeyer, Randleman, R. D. No. 2, N. C.

FOR SALE—Hardy Northern-bred Italian queens and bees. Each and every queen warranted satisfactory. For prices and further information, write.
H. G. Quirin, Bellevue, Ohio.

FOR SALE—Leather-colored Italian queens, tested, until June 1, $2.50; after, $2.00; untested, $1.25; 12, $13.00. Root's goods at Root's prices.
A. W. Yates, 15 Chapman St., Hartford, Conn.

IF GOOD bright Italian queens are wanted by return mail, send your order to M. Bates, Greenville, Ala. Price, $100 per 100. Pure mating, safe arrival, and satisfaction guaranteed.

FOR SALE—300 stands of bees in Standard hives, two-thirds equipped for comb honey and one-third for extracted honey. G. J. Westerik, Mt. Morrison, R. D. No. 1, Box 54, Colo.

JUST to let all my customers know I am still breeding three-banded Dr. Miller stock queens. One untested queen, $2.00; 6 for $11.00. Selects, 25c each higher. Curd Walker, Jellico, Tenn.

BUSINESS-FIRST queens, untested, $1.00 each; select untested, $1.75; tested, $2.25; select tested, $2.50. Safe delivery guaranteed, orders filled promptly. M. F. Perry, Bradentown, Fla.

BEES BY THE POUND — Also QUEENS. Booking orders now. FREE circulars giving details. See larger ad elsewhere. Nueces County Apiaries, Calallen, Texas. E. B. Ault, Prop.

FOR SALE—Golden or three-banded queens, untested only. Order now for shipment June 1 or later. One, $1.50; six, $8.00; 12, $15.00.
Ross B. Scott, LaGrange, Ind.

FOR SALE—Three-banded Italian queens, untested, $1.50 each; 6, $7.50; 12, $14.00. Select untested, $1.75 each. Satisfaction guaranteed. W. T. Perdue & Sons, R. D. No. 1, Fort Deposit, Ala.

FOR SALE—Select untested queens, $2.00 each; six for $11.00. No very large orders solicited. Ready about June 10th.
Dr. C. E. Shelden, Coeur d'Alene, Idaho.

ORDER booked now for delivery June 1, 3-frame nuclei and queen, $7.50; select tested, $8.50. Dr. Miller's strain. No pound packages. Low express rates and quick transit to north.
S. G. Crocker, Jr., Roland Park, Baltimore, Md.

HUMMER QUEENS—Untested, $1.50 each; $15.00 per dozen; tested, $2.00 each; $22.00 per dozen. A trial will convince you that they cannot be beaten. Safe arrival and satisfaction guaranteed. Nuclei at same old prices.
Geo. A. Hummer & Sons, Prairie Point, Miss.

FOR SALE—Golden queens ready May 1; 1, $1.50; 6, $7.50; 12, $14.00; 100, $100. Virgins, 75c each. W. W. Talley, Greenville, R. D. No. 4, Ala.

CAN FURNISH limited number 2-fr. nuclei with untested queen, $5.00 after May 15, receiver to return shipping boxes. H. S. Ostrander, Mellenville, N. Y.

FOR SALE—70 strong hives of bees, 1600 brood-frames, and lots of other supplies, $2000. Also 7-room house, all improvements, lot 125x125, $6500. A. H. Opfer, 6259 Patterson Ave., Chicago, Ills.

ITALIAN QUEENS OF WINDMERE are superior three-banded stock. Untested, $1.50 each; 6 for $8.00; tested, $2.50 each; select tested, $3.00. Prof. W. A. Matheny, Ohio University, Athens, O.

FOR SALE—Golden Italian queens, untested, $1.15; 6 for $6.50; 12 or more, $1.00 each; tested, $2.00 each; select tested, $3.00 each; extra select tested, $4.00 each. No bees for sale.
D. T. Gaster, Randleman, R. D. 2, N. C.

TO MY FRIENDS—I am still doing business at the old stand, and will have a fairly good supply of as good Italian queens as I ever produced. Untested, $1.50 each. Write me.
J. B. Hollopeter, Rockton, Pa.

FOR SALE—A limited number of leather-colored Italian queens. The kind that gets honey. L. C. Keet in 1919 produced 40,000 pounds of honey from 200 colonies. Geo. B. Howe, Sacket Harbor, N. Y.

PURE ITALIAN BEES—Not the cheapest, but the best we can grow, both golden and three-banded, with clean bill of health. Sure to please. Such as we use in our own yards. Untested, $1.50; tested, $2.50. J. B. Notestein, Bradentown, Fla.

DAY-OLD ITALIAN QUEENS—High quality, low price. Safe introduction described in circular. Delivery and satisfaction guaranteed in U. S. and Canada. Price, 1, 50c; 100, $50. Order early.
James McKee, Riverside, Calif.

FOR SALE—2-lb. packages Italian bees and queens by parcel post, postage paid, delivery April 15, for $8.50; 2-frame nuclei with Italian queen by express, not prepaid, delivery May 5, $9.00.
Otto J. Spahn, Pleasantville, N. Y.

FOR SALE—Bees for May and June shipment. Two pounds bees and an untested Italian queen shipped by express on drawn comb with stores. Certificate of health with each shipment.
Ross B. Scott, La Grange, Ind.

WE believe we have the best Italian queens obtainable. Our new system is working wonders. Book your order now for 1921. Untested, $1.50; tested, $3.00; virgins, imported mothers, 50c
F. M. Russell, Roxbury, Ohio.

WE are now booking orders for early spring delivery of two and three frame nuclei, with untested or tested queens. Write for prices and terms. We also manufacture cypress hives and frames.
Sarasota Bee Co., Sarasota, Fla.

1921 price of bees and queens from the A. I. Root Co. leather-colored stock. 1 lb. bees with queen, $5.00; 2 lbs., $7.50. Untested queens, $1.50 each; dozen, $15.00. Safe arrival. Orders booked now.
Greenville Bee Co., Greenville, Ala.

QUEENS—THE FAMOUS BRENNER strain of Italians. Equaled only by the best. Untested, $1.50 each; $15.00 per dozen. Tested, $2.50 each. Satisfaction guaranteed. Dr. A. Wright, Kingsbury, Texas.

ITALIAN QUEENS—Recognized honey-gathering strain, June 10 (a little earlier if possible) until close of season. Untested, each, $1.75; 6, $10.00; 12, $18.50.
R. F. Holtermann, Brantford, Ont., Can.

FOR SALE—Three-banded Italian queens, after May 25, untested, $1.50; 6, $8.00; 12, $15.00. Tested queens, $3.00 each. The above queens are all select. Robt. B. Spicer, Wharton, N. J.

FOR SALE—Unsurpassed Italian queens, ready June 1. Untested, 1, $1.50; 6, $7.50; 12, $14.00; 50, $55.00; 100, $105.00. Tested, 1, $2.50; 6, $13.50. My queens are actually laying before they are sent out. J. D. Harrah, Freewater, Oregon.

FOR SALE—Packages, nuclei, and pure-bred queens—queens from Root Home-bred breeders. Untested, $1.50; tested, $2.50; select tested, $3.00. Safe arrival and mating guaranteed. The Southland Apiaries, Hattiesburg, Miss. W. S. Tatum, Prop.

FOR SALE—Root's strain of Golden and leather-colored Italian queens, bees by the pound and nuclei. Untested, $1.50 each; select untested, $2.00; tested, $2.50 each; select tested, $3.00. For larger lots write. Circular free.
A. J. Pinard, 440 N. 6th St., San Jose, Calif.

SHE-SUITS-ME queens, season of 1921. Untested Italians, $2.00 each, 10 or more, $1.75 each, from May 15 to June 15. After June 15, $1.50 each, up to nine queens; 10 to 24 queens, $1.40 each; 25 and up, $1.25 each.
Allen Latham, Norwichtown, Conn.

HAVING purchased leather queens from the best honey-gathering stock obtainable, we will rear a few three-banded queens in yards set apart for that purpose, at the following prices: Untested, $2.00; tested, $5.00; select breeders, $10.00. C. W. Phelps & Son, 3 Wilcox St., Binghamton, N. Y.

THREE-BANDED Italian only, that have been bred to a high standard of excellence. Never had disease in my apiaries. Safe arrival and satisfaction guaranteed. Untested queens, $1.50; 12, $15.00; tested queens, $2.25; 12, $25.00.
Jul Buegeler, New Ulm, Texas.

FOR SALE—Three-band Italian bees and queens, ready June 1. Fine stock, free from disease and guaranteed to please you. (One grade) select untested queens, $1.50 each; 6, $8.00; 12, $15.00; 50, $60.00. Nuclei, $3.00 per frame, Hoffman; bees, $3.00 per pound. A. E. Crandall, Berlin, Conn.

THREE-BANDED ITALIAN BEES and queens. Two standard Hoffman frame nuclei, with untested queen, $5.50; three-frame, as above, $6.50. Orders booked in rotation. All dead bees will be replaced. Can furnish government inspection certificate of no disease. L. C. Mayeux, Hamburg, La.

WHEN BETTER QUEENS are raised Victor will raise them. Three-banded Italians only, mated, $1.25 each; 6, $7.00; 12, $13.50; 100, $110.00. Tested, $3.00. Breeders, $10 to $25. Safe arrival guaranteed only in U. S. and Canada.
Julius Victor, Martinsville, N. Y.

ITALIAN QUEENS—Three-banded, select untested, guaranteed. Queen and drone mothers are chosen from colonies noted for honey production, hardiness, prolificness, gentleness, and perfect marking. Price, May and June, $1.50 each; 12 or more, $1.25 each. Send for circular.
J. H. Haughey & Co., Berrien Springs, Mich.

"QUEENS, QUALITY FIRST QUEENS." High-grade, pure, three-banded and golden Italians. These queens are as good as can be bought; are gentle, prolific, and good honey-gatherers. I guarantee safe arrival and satisfaction. Why not try these and be convinced? Untested, $1.25 each; 6, $6.50; 12, $12.50. Selected untested, $1.50; 6, $8.00.
G. H. Merrill, Pickens, S. C.

TWO-FRAME NUCLEI with untested Italian queens from the apiary of E. R. King, formerly inspector in Ohio and later in charge of Apiculture at Cornell University. No disease in territory, May delivery, $7.50; June, $6.50; July, $5.00; 50 per cent cash with order. If queen is not wanted, deduct $1.25 from above prices.
Miss E. J. King, McArthur, Ohio.

PHELPS' GOLDEN ITALIAN QUEENS combine the qualities you want. They are GREAT HONEY-GATHERERS, BEAUTIFUL and GENTLE. Virgins, $1.00; mated, $2.00; tested, $5.00. Breeders, $10 to $20. Safe arrival guaranteed only in the U. S. and Canada.
C. W. Phelps & Son, Binghamton, N. Y.

FOR SALE—Italian queens, untested, in June: 1, $1.50; 6, $8.25; 12, $16.00; tested, $2.50 each. From July 1 to Oct. 1, untested: 1, $1.25; 6, $7.00; 12, $13.50; tested, $2.00. I have a tested breeding queen from the A. I. Root Co., and will breed queens from her for those that prefer them to my old strain of hustlers. Safe delivery and satisfaction guaranteed. R. B. Grout, Jamaica, Vt.

BEGINNING June 5 I can supply you with three-banded Italian queens by return mail. Select untested, $1.50 each, or $15.00 per dozen. Tested, $2.50 each. I also have nuclei for immediate shipment; 2-frame nucleus, $5.00; 3-frame nucleus, $6.50. Add price of queen wanted to price of nucleus. Frank Bornhoffer, R. D. No. 17, Mt. Washington, Ohio.

NORTH CAROLINA bred Italian queens of the Dr. C. C. Miller strain of three-band Italian bees. Gentle and good honey-gatherers. From May 1 until July 1: Untested, $1.50 each; $15.00 per doz.; selected untested, $1.75 each, $17.50 per doz.; tested, $2.25 each; $22.50 per doz., selected tested, $3.00 each. Safe arrival and satisfaction guaranteed. L. Parker, Benson, R. D. No. 2, N. C.

FOR SALE—Three-band leather-colored Italian queens of the J. P. Moore strain, hardy, prolific, hustlers, no disease. Safe arrival and satisfaction guaranteed. Prompt attention given all orders. 1 untested, $1.25; 12, $13.50; 1 select untested, $1.50; 12, $15.00; 1 tested, $2.00; 12, $19.00; 1 select tested, $2.50; 12, $25.00. Write for circular and further information. J. M. Cutts, Route No. 1, Montgomery, Ala.

FOR SALE—Three-banded Italian bees and queens for June delivery. All bees are shipped on a standard Hoffman frame of brood and honey, 2 lbs. bees with untested queen, $5.00; 3 lbs., same as above, $6.25; 2-frame nuclei with untested queen, $5.00. All dead will be promptly replaced if noted by agent on express tag. Can furnish state inspection health certificate of no disease.
C. A. Mayeux, Hamburg, La.

QUEENS—Three-banded Italians only. Now that the booking season for nuclei has passed, and while I have a large number of orders for nuclei, I shall not be too busy with these to fill your orders for queens, 1 untested for April, 1.25; 12, $12.50; 1 untested for May 1 to June 1, $1.00; 12, $10.00; I ship no queens after June 1; weather is too hot. Discount on large orders. Safe arrival guaranteed.
L. R. Dockery, Carrizo Springs, Texas.

FOR SALE—Bright Italian queens and bees, untested queens, $1.50 each; $15.00 per dozen; 1 lb. bees, $5.00; 2 lbs. bees, $9.00. If queen is wanted with bees add the price of queen. We guarantee safe arrival and reasonable satisfaction in U. S. and Canada. Cash or certified check must accompany the order for prompt shipment, unless parties are known or satisfactorily rated.
Graydon Bros., Greenville, R. D. No. 4, Ala.

PRITCHARD QUEENS (Three-banded Italians) —My first season selling direct to the trade. June prices: Untested, $1.75 each; 6 for $9.50; select untested, $2.00 each; 6 for $11.00. For delivery after June 30th, deduct 25 cents for each queen. A liberal discount will be given on larger quantities. I will have a few choice virgins, tested, and breeders to spare; write for prices. Queens clipped free of charge on request. Acknowledgment and directions for introducing sent on receipt of order. Safe delivery and satisfaction guaranteed. Specify date of shipment desired, otherwise orders will be filled in rotation. Arlie Pritchard, Medina, Ohio.

HELP WANTED.

WANTED—One experienced man and students, clean habits, able-bodied and willing workers, as helpers with our more than 1000 colonies. Opportunity to learn the business from A to Z. 1920 crop 122,000 pounds. Theory also. Write immediately giving age, height, weight, habits, former employment, experience, references, wages, photo, all in first letter. E. F. Atwater (former Special Field Agent in Beekeeping, U. S. Dept. Agr.), Meridian, Idaho.

Queens

Write for our catalog of high-grade Italian Queens. Pure mating and safe arrival guaranteed.

Prices for 1921.

1 to 4 inclusive	$3.00 ea.
5 to 9 inclusive	2.90 ea.
10 or more...	2.80 ea.
Breeders	12.00 ea.

Jay Smith

Route Three
Vincennes, Indiana.

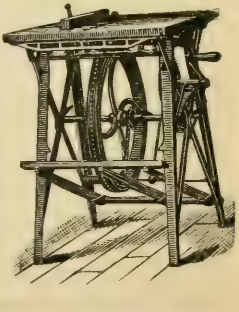
Comb Honey Producers

MAKE MORE MONEY

By using the Rauchfuss Combined Section Press and Foundation Fastener, the best, most accurate, and rapid device of its kind to be had. Will set up 4,000 sections a day and each will be exactly right. Write for descriptive circular. Price $9.10; mailing weight, 4 lbs.

H. D. RAUCHFUSS, Englewood, Colo.

BARNES'
Hand and Foot Power Machinery



This cut represents our combined circular saw, which is made for beekeepers' use in the construction of their hives, sections, etc.

Machines on Trial

Send for illustrated catalog and prices.

W. F. & JOHN BARNES CO
545 Ruby Street
ROCKFORD, ILLINOIS

"Best" Hand Lantern

A powerful portable lamp, giving a 300 candle power pure white light. Just what the farmer, dairyman, stockman, etc. needs. Safe—Reliable —Economical—Absolutely Rain, Storm and Bug proof. Burns either gasoline or kerosene. Light in weight. **Agents wanted. Big Profits. Write for Catalog.** **THE BEST LIGHT CO.**
306 E. 5th St., Canton, O.

Golden and Three-Banded Queens

Northern Queens for Northern Beekeepers

THE DEPARTMENT OF CONSERVATION
STATE OF INDIANA
Division of Entomology
INDIANAPOLIS, IND.

Indianapolis, Jan. 17, 1921.

Mr. Ross B. Scott, Lagrange, Ind.

Dear Mr. Scott: I am pleased to learn that you anticipate enlarging your queen-rearing department, since the increased production of high-grade queens, such as you have been sending out, is of vast importance.

During the past year I have had the opportunity of seeing a large number of queens, and their bees, bought of you; and I commend you for your careful selection, care in shipping, and excellent quality of stock furnished your customers.

Last season I helped to introduce 147 golden Italian queens, bought of you by members of a county association; they were a beautiful lot of queens, all arrived in fine condition; and, as they were to be received on three different days, the fact that they arrived on exactly the days you promised is a feature of efficiency much appreciated by beekeepers. Wishing you continued success, I am, yours very truly,

C. O. YOST, Chief Inspector Apiaries.

Untested queens for June delivery: One, $1.50; six, $8.00; dozen, $15.00. Safe arrival and satisfaction.

ROSS B. SCOTT, Lagrange, Indiana

Too Late for Classification.

WANTED—Alfalfa and timothy hay, also oats, carlot. State lowest price.
Thomas J. McDermott, Belleville, N. J.

WANTED—A Barnes wood-working outfit. State what you have and price. J. W. Sherman, Valdosta, Ga.

FOR SALE—50 empty Danzenbaker bodies, freshly painted, 70c each, $30.00 takes the lot.
Wm. Stika, Little Ferry, N. J.

FOR SALE—Cowan 2-frame extractor, $25.00. Emil E. Nelson, R. D. No. 5, Box 104, Hutchinson, Minn.

FOR SALE—Auto trailer. Made for beeyard use. Pneumatic tires. Photo furnished. $60.00.
B. F. Kindig, East Lansing, Mich.

COLORADO QUEENS. Pure Italians. Our sunny climate and altitude produce the best there are. Write now for price list. C. I. Goodrich, breeder of fine queens, Wheatridge, Colo.

WILLOW DELL queens and nuclei stand the test with any. Queens, $1.25; 2-fr. nuclei, $5.00; 4-fr., $8.00, including fine untested queen. Ready for delivery, receiver to return nuclei boxes collect.
H. S. Ostrander, Mellenville, N. Y.

A BARGAIN—I shall select 40 of the best colonies in one of our out-yards this year to run for increase. Now I want the queens in these all sold, so I can remove them all at the same time to start cells for increase. They are all less than one year old, right in the prime of their life. Mothers of prime colonies, the pick of the whole yard, and purely mated, descendants of the famous Moore strain of leather-colored Italians. In order to have those queens all sold when I want to remove them I am going to offer them at a bargain. I will sell them for $1.50 each, cash with order. Orders may be sent now; first ones to send get the queens. Queens will be mailed sometime about the 15th or 20th of June, dependent on the season and weather. Safe arrival and satisfaction guaranteed. Elmer Hutchinson & Son, Lake City, Mich.

Italian Queens

$2.00 each.

APIARIAN SUPPLIES

I. J. Stringham

Glen Cove, New York.

INDIANOLA APIARY

will furnish 3-banded Italian bees and queens: Untested queens, $1.00 each; tested, $1.50 each. One pound bees, no queen, $2.00. No disease.

J.W.SHERMAN,VALDOSTA,GA.

NEW ENGLAND

BEEKEEPERS will find a complete stock of up-to-date supplies here. Remember we are in the shipping center of New England. If you do not have a 1921 catalog send for one at once.

H. H. Jepson, 182 Friend St., Boston 14, Mass.

Stop Losing Valuable Queens!

This can be done by the use of the Jay Smith Push-in-the-Comb introducing cage. This cage has been thoroughly tested, and will give very satisfactory results. For complete information on this cage, see pages 498 to 500, August, 1919, "Gleanings in Bee Culture." Price complete, 75 cents each; ten, $7.00; one hundred, 60.00.

The A. I. Root Company
West Side Station
MEDINA OHIO

ROOT'S BEE SUPPLIES

Carload stocks at Ohio's distributing center. Orders filled the day they come in. Save time and freight by ordering from

A. M. MOORE, Zanesville, Ohio
22½ S. Third Street.

QUEENS

June queens that fill the supers.
Orders filled promptly.

PURE THREE-BAND ITALIANS

Untested, $1.25
Select Untested, $1.50

D. W. HOWELL
Shellman, Ga.

GOLDEN QUEENS FOR 1921

Untested queens for delivery from April 20th to July 1st, $1.50 each, or 6 for $8.00; for hundred lots write for prices. I guarantee safe arrival and reasonable satisfaction, and all orders and inquiries will be answered promptly.

R. O. COX
Route 4, Luverne, Ala.

MASON BEE SUPPLY COMPANY

MECHANIC FALLS, MAINE
From 1897 to 1921 the Northeastern
Branch of The A. I. Root Company

Prompt and Efficient Service

BECAUSE—Only Root's Goods are sold.
It is a business with us—not a side line.
Eight mails daily.
Two lines of railway,

If you have not received 1921 catalog send name at once.

STUTT'S ITALIAN QUEENS

are supreme queens; ready June 1. Untested, $1.25; 6, $6.50; 12, $12.50. Select untested, $1.50; 6, $8.00; 12, $15.00. Pure mating and safe arrival guaranteed.

ALFRED A. STUTT, Lincoln, Ills.

Queens—Rhode Island—Queens

Italian Northern-bred queens. Very gentle and hardy. Great workers. Untested, $1.25 each; 6 for $7.00. Circular on application.

Queens delivered after June 1.

O. E. TULIP, Arlington, Rhode Island
56 Lawrence Street.

LARGE, HARDY, PROLIFIC QUEENS

Three-band Italians and Goldens. Pure mating and safe arrival guaranteed. We ship only queens that are top notchers in size, prolificness, and color. After June 1st: Untested queens, $1.50 each; 6 for $8.00; 12 or more, $1.40 each: 25 or more, $1.25 each. Tested queens, $3.00 each; six for $16.00.

Buckeye Bee Co., Justus, Ohio.

GOOD WILL AND GOOD QUEENS

ARE BACK OF

FOREHAND'S THREE BANDS

THE THRIFTY KIND

Good will has made our success.

Our good queens will make your success.

These two forces working together have made it possible for us to serve the beekeepers for over a quarter of a century.

Hearty support for twenty-nine years.

Good Queens for twenty-nine years.

Each is the proof of the other. Both are proof that you will not make a mistake when you requeen with Forehand's Three Bands—the bees that are **surpassed by none but superior to many.**

Good queens are the success of an apiary. Your success is ours. We try to help you in every way. We give you good queens and good service. We guarantee pure mating, safe arrival, and satisfaction.

We are now booking orders for immediate delivery.

Write for circular giving full information on bees and queens.

PRICES:

Up to June 30.

	1	6	12
Untested	$2.00	$10.00	$18.00
Select Untested	2.25	11.50	21.00
Tested	3.00	16.00	30.00
Select Tested	4.50	25.00	45.00

Pound Bees from May 1 to June 15.

One-pound package: 1, $3.75; 25 or over, $3.50; 50 or over, $3.25; 100 or over, $3. Two-pound package: 1, $6.00; 25 or over, $5.80; 50 or over, $5.40; 100 or over, $5. Add the price of the queen wanted.

Write for prices in large quantities.

W. J. FOREHAND & SONS
FORT DEPOSIT, ALABAMA

Buy Your Bee Supplies Now

Take advantage of early-order discounts by ordering NOW. We guarantee to please you. "Prompt service and the very best" is our motto. *We want your beeswax and old comb.* Highest cash and trade prices offered. Texas beekeepers should write A. M. HUNT, Goldthwaite, Texas.

Manufactured by

Leahy Manufacturing Company

95 Sixth St., Higginsville, Missouri.

Write for FREE catalog. It is to your interest.

Established 1885.

Write us for catalog.

BEEKEEPERS' SUPPLIES

ALWAYS ON TOP

The Kind You Want and the Kind That Bees Need.

We have a good assortment in stock of bee supplies that are mostly needed in every apiary. The A. I. Root Co.'s brand. Let us hear from you; information given to all inquiries. Beeswax wanted for supplies or cash.

John Nebel & Son Supply Co.

High Hill, Montgomery Co., Mo.

SPECIAL CROPS

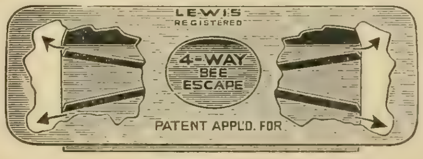
$10,000.00 per acre every 5 years.

A high grade monthly devoted to growing MEDICINAL plants. $1.00 per year, sample copy ten cents.

HYBRID POTATO SEED. Something new. Every seed will give you new variety of potato. You will get all shapes and all colors. Some better than old standard sorts and some not as good. Package of this seed 25 cts. Potato seed and new subscription both for $1.00. Address

SPECIAL CROPS PUB. CO.
Box G, Skaneateles, N. Y.

LEWIS 4-WAY BEE ESCAPES



Four exits from supers. Fits all standard boards. Springs of coppered steel. Made of substantial metal. Made by

G. B. Lewis Company, Watertown, Wis., U.S.A.

Sold only by Lewis "Beeware" Distributors.

Happy Hours in Texas.—Continued from page 355.

travel, even if the best part of the whole trip is the getting back home to one's children again; and it sounds larger to measure the time by hours instead of days, for there have been times when the latter term would have had to be stated in fractions instead of the plural. And yet my p. c. claims he travels more slowly when I am along. Speaking in an Irish manner, I would hate to accompany him when he travels alone.

PATENTS Practice in Patent Office and Court. Patent Counsel of The A. I. Root Co.

Chas. J. Williamson, McLachlan Building, WASHINGTON, D. C,

The "BEST" LIGHT

Positively the cheapest and strongest light on earth. Used in every country on the globe. Makes and burns its own gas. Casts no shadows. Clean and odorless. Absolutely safe. Over 200 styles. 100 to 2000 Candle Power. Fully Guaranteed Write for catalog. AGENTS WANTED EVERYWHERE.

THE BEST LIGHT CO.
306 **E. 5th St., Canton, O.**

Raise Guinea PIGS-FOR US!

We need men and women, boys and girls everywhere to raise Guinea Pigs for us. We tell you where to get them, show you how and buy all you raise. Big opportunity for money making. Thousands needed weekly.

Easy to Raise—Big Demand No special knowledge,

Large Profits experience or equipment needed. They breed the year round—are very prolific—require but little space or attention. Pay better than poultry or squabs—cost less to house, feed, keep, easier raised—less trouble, market guaranteed.

Particulars, contract, and booklet how to raise FREE

CAVIES DISTRIBUTING COMPANY
3145 Grand Avenue, Kansas City, Mo.
Largest Guinea Pig breeders and distributors in America.

World's Best Roofing at Factory Prices

"**Reo**" Cluster Metal Shingles, V-Crimp, Corrugated, Standing Seam, Painted or Galvanized Roofings, Sidings, Wallboard, Paints, etc., direct to you at Rock-Bottom Factory Prices. Positively greatest offer ever made.

Edwards "Reo" Metal Shingles

cost less; outlast three ordinary roofs. No painting or repairs. Guaranteed rot, fire, rust, lightning proof.

Free Roofing Book

Get our wonderfully low prices and free samples. We sell direct to you and save you all in-between dealer's profits. Ask for Book No. 183

LOW PRICED GARAGES

Lowest prices on Ready-Made Fire-Proof Steel Garages. Set up any place. Send postal for Garage Book, showing styles.

THE EDWARDS MFG. CO.,
633-683 **Pike St., Cincinnati, O.**

FREE Samples & Roofing Book

NOTICE!

Pritchard Queens

are not just common queens named, but

A NOTED STRAIN

The result of years of careful breeding and selection. Reared and offered for sale by

ARLIE PRITCHARD

Medina, Ohio.

See my classified ad, page 307 for prices and guarantee.

QUEENS

Select Three-Banded Italians. I have one of the most modern queen-rearing apiaries in the South, and am breeding from the best Italian stock to be found. Pure mating, prompt and safe arrival guaranteed.

	1	12	50 or more
Untested	$1.50	$15.00	$1.00 each
Tested	3.00	30.00	

Write for descriptive circular and prices on queens in lots of 100 or more.

HARDIN S. FOSTER,
Dept. G, Columbia, Tenn.

Spicer's Three-Banded Italian Queens

now ready to mail. These queens are bred so as to have all the desired qualities, hustlers, hardy, and gentle.

	1	6	12
Untested queens	$1.50	$8.00	$15.00
Tested queens	3.00	16.50	30.00

I do not list select queens, as the above are all select. Safe arrival and satisfaction guaranteed.

ROBERT B. SPICER
Wharton, N. J.

THREE-BAND and GOLDEN QUEENS

That produce hustling bees. Bred to fill the supers from the finest breeding strains obtainable. Hustlers, long-lived, and as beautiful in size and color as can be. Price each, untested, $1.75; tested, $3.00. Orders filled promptly, satisfaction guaranteed. Ask for price on large orders.

DR. WHITE BEE COMPANY
SANDIA, TEXAS.

NEWMAN'S ITALIAN QUEENS

Bred From the Best. Absolutely First Quality and fully guaranteed. No disease. Satisfaction and safe arrival. Untested, $1.50; 6, $8.00; 12, $15.00. Select Untested, $2.00; 6, $10.00. 12, $19.00. Circular free.

A. H. NEWMAN, Queen Breeder
MORGAN, KY.

'Queens of Quality'

Three-band Italians Only.

Bred from our heaviest producers—and we have six outyards. Untested now ready, $1.50 each. You make dollars where we make cents in buying these queens. We guarantee safe arrival, pure mating, and entire satisfaction. Not a single complaint in seven years.

J. I. BANKS
Dowelltown, Tenn.

QUEENS! QUEENS! QUEENS!

Have you secured all you need? I have them as fine as you can secure anywhere at a reasonable price. After May 15th you can get them at the following prices. If you want them earlier look on page 179, March issue, or you will find my ad in the April issue of Gleanings.

	1	12
Untested queens	$1.50	$13.50
Tested queens	2.50	26.00
Select tested	3.00	30.00

Breeders $5.00 to $10.00 at all times.

You will notice that I don't advertise any select untested queens. It is because all that I ship now are selected. If they are not the best, I don't ship them; and if they don't give you satisfaction and you write me, I will make it satisfactory to you.

H. L. MURRY
Soso, Mississippi.

QUEENS OF

MOORE'S STRAIN

OF ITALIANS
PRODUCE WORKERS

That fill the super quick
With honey nice and thick.

They have won a world-wide reputation for honey-gathering, hardiness, gentleness, etc. Untested queens, $2.00; 6, $11.00; 12, $21. Select untested, $2.25; 6, $12.00; 12, $23. Safe arrival and satisfaction guaranteed. Circular free.

J. P. MOORE, Queen Breeder
Route 1, Morgan, Kentucky

Norman Brothers' Queens

Mr. Beekeeper, if you want good quality, quick service, prompt attention, and perfect satisfaction, TRY NORMAN BROS. pure three-banded Italians and see for yourself. We are not going to say that we have the best in U. S. A., but we do say we have as good as can be bought for the money. Our bees are hardy, gentle, prolific, disease-resisting and honey-gatherers. Orders filled promptly by return mail or your money refunded. We guarantee pure mating, freedom from all diseases, and safe arrival in U. S. A. and Canada. Remember that you take no risk when you deal with us. Isn't that enough said?

Prices June & July:	1	6	12	50
Untested Queen	$1.50	$8.00	$15.00	$50.00
Select Untested	1.75	8.25	16.50	58.00
Tested Queen	3.00 each			
Select Tested	4.00 each			

Norman Brothers' Apiary

NAFTEL, ALABAMA

Quigley's Queens and Bees

Three-Banded Italians are bred from ideal colonies by double grafting, producing queens of superior quality. Twenty years building this strain from the best honey-producing colonies. No disease, 35 years in this location. June delivery, booking orders. Tested, $3.00; untested, $2.00; 6, $11.00; 12, $20.00. Breeders, $10.00, shipped on brood. Three-frame nucleus with untested queen, $9.00; tested, $10.00. Ten-frame colony with tested queen, $20.00. Two-pound package with untested queen, $8.00; tested, $9.00.

Purity and satisfaction guaranteed. Send for circular.

E. F. Quigley & Son, Unionville, Mo.

Northwestern Headquarters for Italian Queens

The queen is the life of the colony. You cannot afford to keep poor queens or a poor strain of bees. I have been in the bee business for more than twenty years and have made every effort to improve the honey-gathering qualities of my bees by purchase of breeders and by selective breeding. I believe that my bees are unsurpassed by any. When you buy Untested Queens from me you are getting select untested queens. I will begin mailing queens about June 1.

Prices June 1 to October 1:	1	6	12	50	100
Untested Italian Queen	$1.50	$7.50	$14.00	$55.00	$105.00
Tested Italian Queen	2.50	13.50			

I have no pound packages or nuclei for sale.

J. D. HARRAH, Route 1, Freewater, Oregon

QUALITY QUEENS AT QUANTITY PRICES

BREED THREE-BANDED ITALIANS ONLY

Prices for 1921:	Nov. 1 to June 30			July 1 to Nov. 1		
	1	6	12	1	6	12
Untested	$2.00	$9.75	$18.00	$1.50	$8.00	$15.00
Selected Untested ..	2.25	11.25	19.80	1.75	9.75	16.80
Select Tested	3.50 each			3.00 each		

Breeding queens after June 15th, with 2-fr. nuclei, $15.00 each.

Queens are reared from mothers whose colonies are GENTLE, HARDY, and as HONEY GATHERERS will compare with any. I rear all my queens personally by the latest and most approved methods, which insure queens that are capable of duplicating the excellent characteristics of their mothers. You take absolutely no risk in ordering my queens, for satisfaction and safe arrival are guaranteed in U. S. and Canada. Since I produce QUALITY instead of QUANTITY you should place an early order to insure getting your queens on time. I sell no bees by the pound nor nuclei ONLY with high-priced breeding queens. Foreign shipments at receiver's risk. Health certificate with each shipment.

HERMAN McCONNELL, Robinson, Illinois

Lower Prices

Order from these quotations.
Write for complete price list.

Untested Italian queens	$ 1.25
Queens, per hundred	98.75
Two pounds bees with queens....	5.75
Hundred packages bees with queens	550.00
Sections, No. 2 grade............	12.60
Hoffman brood-frames, per M......	65.00
5-pound friction-top pails (200)..	20.50
Cases 5-gallon cans, 2 in case....	1.35
5-gallon cans in bulk (100)	41.75
Shipping cases for comb honey, per 100	50.00

Airco Comb Foundation

	1 lb.	25 lbs.	100 lbs.
Medium Brood	$0.85	$0.80	$0.75
Light Brood	.87	.82	.77
Thin surplus	.90	.85	.80
Extra thin surplus...	.92	.87	.82

The Foster Honey & Merc. Co.

Boulder, Colorado.

"Foster Your Business"
"Airco Your Bees"

QUALITY
TIN CANS
FIRST
For PACKERS and
MANUFACTURERS
of
FOOD PRODUCTS
LARGE CAPACITY
LONG EXPERIENCE
YOUR INQUIRIES SOLICITED
W. W. BOYER & CO. INC.
BALTIMORE, MD.

Glass and Tin Honey Containers

2½-lb. Cans, 2 dozen reshipping cases.............$1.45 case; crates of 100, $ 6.50
5-lb Pails (with handles), 1 dozen reshipping cases 1.35 case; crates of 100, 8.30
10-lb. Pails (with handles), ½ doz. reshipping cases 1.10 case; crates of 100, 12.75
60-lb. Tins, 2 per case—NEW, $1.30 case; USED, 50c.

WHITE FLINT GLASS, WITH GOLD LACQD. WAX LINED CAPS.

8-oz. Honey Capacity, Cylinder Style................$1.50 per carton of 3 dozen
16-oz. Honey Capacity, Table Jar Service.............. 1.40 per carton of 2 dozen
Quart or 3-lb. Honey Capacity, Mason Style............ 1.00 per carton of 1 dozen

HOFFMAN & HAUCK, Inc. - - Woodhaven, New York

BANKING BY MAIL AT 4%

THE FUTURE

contains no worry or anxiety for the man who deposits a portion of his earnings regularly BY MAIL at 4% interest with this bank. Write for booklet.

THE SAVINGS DEPOSIT BANK Co.

A. T. SPITZER, Pres.
E. R. ROOT, Vice Pres. E. B. SPITZER, Cash.

MEDINA, OHIO

Italian Bees and Queens

For Delivery after June 5th.

Nuclei:	12	25	50
3-fr.	$1.50 ea.	$4.25 ea.	$4.00 ea.
4-fr.	5.50 ea.	5.25 ea.	5.00 ea.

8-fr. colony in ten-frame, lock-joint cypress hive-body, $11.50 ea., for 12; $10.50 ea. for 25; $9.50 ea. for 50 or more. Add price of queen desired with each nucleus or colony. Standard fixtures wired frames.

Queens:	12	25	50
Untested	$1.25 ea.	$1.20 ea.	$1.10 ea.
Sel. Unt.	1.50 ea.		
Tested	2.25 ea.		

Select Tested, 1, $3.50; 3, $9.75; 6, $27.

100 or more untested queens, $1.00 ea.

Bees shipped by express f. o. b. shipping point. Safe arrival, no disease, and satisfaction guaranteed.

J. L. St. ROMAIN, Apiarist

White Clover Farm and Apiary.
HAMBURG, LOUISIANA

QUEENS

FROM SELECT BREEDING

21 Years of Experimenting. We have nothing but the very best.

3-BAND ONLY

Price Cash With Order.

Before July 1st.

Untested	$1.50
Selected	2.25
Tested	3.00
Selected	3.50

Orders filled in rotation. Write for prices in large quantities.

Did you get what you were looking for when you bought your last year's Queens? If not, try one that will please you. My queens are reared on a new system, large and prolific, surpassed by none but superior to many. No complaint last year.

F. M. RUSSELL
IMPORTER
ROXBURY, OHIO R. F. D. No. 2

Beeswax Wanted

In big and small shipments, to keep Buck's Weed-process foundation factory going. We have greatly increased the capacity of our plant. We are paying higher prices than ever for wax. We work wax for cash or on shares.

Root Bee Supplies

Big stock, wholesale and retail. Big catalog free.

Carl F. Buck

The Comb-foundation Specialist
August, Kansas
Established 1899.

QUEENS AND BEES

We have one of the most modern queen-rearing outfits in the United States, and are breeding from new imported Italian blood. We produce QUALITY instead of QUANTITY.

A limited number of orders for spring delivery will be accepted at the following prices:

Quantity	1	6	12	24
Untested	$2.00	$11.40	$21.60	$40.80
Sel. Untested	2.25	12.80	24.30	45.90

Special price of $1.50 each on untested queens for June delivery in lots of 12 or more, if booked in advance.

We are also prepared to furnish full colonies, nuclei, and pound packages. Write today for prices.

The A. I. Root Co. of Texas
P. O. Box 765,
SAN ANTONIO, TEXAS.

Quality Bee Supplies From a Reliable House

¶ Without fear or favor I place my BEE SUPPLIES and SERVICE before you.

¶ It is the small annoyances that often grow into disastrous results. Avoid the so-called "little losses" by using MONDENG'S goods. Quality is first—save time when you put your goods together by getting supplies that are accurately made. Service is next—no delays when bee supplies are ordered from my factory.

¶ I am ready to meet your urgent needs. Send for my latest price-list.

¶ Closing out all Langstroth and Wisconsin hives and supers. Also Langstroth triangular top-bar frames, and eight-frame D. T. supers for 4 x 5 sections. At cost price, write for quotations.

Charles Mondeng
146 Newton Ave. N. &
159 Cedar Lake Road.
MINNEAPOLIS, MINNESOTA.

Take Notice, Beekeepers

We have for June delivery 500 packages bees with untested queens at reduced prices. When you buy bees from us you know they will arrive in good condition. This is our eleventh successful year in shipping bees to all parts of U. S. and Canada. Remember you take no chances. We stand good the loss. One and two lb. packages are shipped on a standard Root-Hoffman brood-frame with brood and honey, which insures safe arrival.

One pound bees and queen	$4.00
Two pounds bees and queen	5.00
Two-frame Nucleus and queen	4.75
Three-frame Nucleus and queen	5.50
Untested queen without bees, ea.	1.25
12 for	12.00
Selected Tested, each	1.75

The above stock is three-banded only. We ship by express only. We guarantee no disease and safe delivery.

Where satisfaction comes from.

OSCAR MAYEUX
Lock Box No. 15.
HAMBURG, LA.

Completely Destroys the Weed Growth

More than that, the BARKER breaks the hardest crust into a level, porous, moisture-retaining mulch — **all in the same operation.**

A ten-year-old boy can run it—do more and better work than ten men with hoes. Saves time and labor, the two big expense items.

BARKER WEEDER, MULCHER AND CULTIVATOR

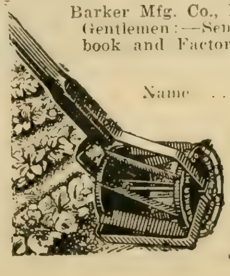
Eight reel blades revolve against a stationary underground knife—like a lawn mower. **BEST WEED KILLER EVER USED.** Works right up to plants. Cuts runners. Aerates the soil. Has leaf guards, and shovels for deeper cultivation—3 *garden tools in* 1.

FREE ILLUSTRATED BOOK.

Tells how gardeners and fruit-growers everywhere are reducing their work; increasing their yields.—How to bring growing plants through a dry season.—How to conserve the moisture and force a larger, more rapid growth. Send TODAY for this free, illustrated book and special Factory-to-User offer.

BARKER MANUFACTURING COMPANY

Dept. 23. David City, Neb.



Barker Mfg. Co., Dept. 23, David City, Neb.
Gentlemen:—Send me postpaid your free book and Factory-to-User offer.

Name . . . .

Town . . . .

State . . . .

R. F. D. or Box . . . . . .

Southern Headquarters

Reliable Three-Banded Italian Queens

For several years our queens have been used and recommended by a number of the foremost beekeepers in the U. S. and Canada. We cannot afford to disappoint them, and we *will not* disappoint you.

Having several hundred colonies in outyards to select breeding stock from, and large well-equipped queen-rearing yards, we are sure we offer you something good. We pay special attention to honey-gathering qualities, but do not forget gentleness, beauty, etc. Our queens are good to look at, and their bees a pleasure to work with.

Prices to July 1: Untested, $1.50 each; six, $8.50; twelve, $16.00; fifty or more, $1.25 each. Tested, $3.00 each.

Prompt service, safe arrival of queens, and satisfaction, we guarantee. Any queens that prove to be mismated will be replaced free of charge. No foul brood or other contagious bee disease has ever been in our vicinity.

W. D. ACHORD, Fitzpatrick, Alabama.

ITALIAN BEES & QUEENS OF PURE THREE-BAND STOCK

Bred from best hustlers, by methods that years of experience have taught us are best, including the use of large, strong nuclei, which insures young queens emerging strong and vigorous. Safe arival in U. S. and Canada. Health certificate with each shipment. Satisfaction guaranteed.

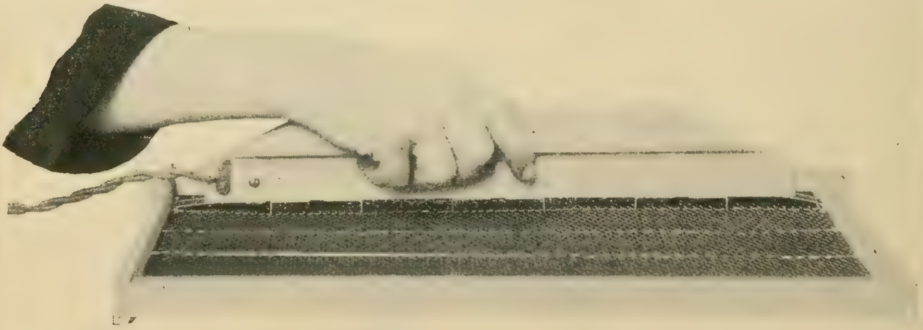
Untested	1 to 12, $1.50 each.	Over 12, $1.25 each
Select Untested	1 to 12, $1.75 each.	Over 12, $1.50 each
Tested	1 to 12, $2.50 each.	Over 12, $2.25 each
Select Tested, suitable for breeders		$5.00 each

Two-frame nuclei, $5.00. Three-frame nuclei, $7.00; add price of queen wanted with each. Eight-frame colony, $15.00. Ten-frame colony, $17.50. Standard equipment all around, and wired frames.

JENSEN'S APIARIES, CRAWFORD, MISS., R. F. D. No. 3.

THE ROOT ELECTRIC WIRE IMBEDDER

Can be operated on current from any automobile storage battery. The most rapid tool for imbedding one wire at a time. Price $1.25 postpaid.



The Root Electric Wire Imbedder is operated by any storage battery, or lighting circuit in connection with resistance. By simply pressing the tool firmly down against the wire with the sheet of foundation on a form board, the wire is easily and quickly imbedded into the foundation. When the tool is removed the circuit is broken. Complete directions sent out with each imbedder.

THE A. I. ROOT COMPANY, MEDINA, O.

SELECT THREE-BANDED ITALIANS OF THE HIGHEST QUALITY ONE GRADE

800 honey-gathering colonies from which to select the very best breeders. No one has better bees than I. Can make prompt delivery by return mail. I have not yet disappointed a customer.

PRICES: Untested (to July 1): each $1.50; 12 or more $1.25 each. After July 1, 1 to 49 $1.25 each, 50 or more, $1.00 each. Tested (to July 1), each $2.00. Breeders (to July 1), $25.00 each.

Pure mating, safe arrival, and satisfaction guaranteed. It is left with customer to say what is satisfaction.

My customers say my queens stand the northern winters. They are bred up for this, combined with the highest honey-gathering qualities and prolificness.

A new customer from Missouri, where you have to show them writes: "The dozen queens arrived promptly. They are the most beautiful I ever saw."—(Name on request.)

Another one from the same state writes: "Your 100 2-lb. packages averaged 90 pounds surplus honey per colony, 10 pounds more per colony than the other 2-lb. packages purchased elsewhere."—H. H. Thale, Durham, Mo.

Now listen to this, from Ontario, Canada: "Bees and queens purchased of you last season all wintered without a single loss. Save me 50 untested queens for May delivery."—(name on request.)

JASPER KNIGHT, Hayneville, Ala.

BEE SUPPLIES The Very Best Quality & Service

We have a large stock of Hives, Bodies, Supers, Foundation, and other supplies ready for immediate shipment.

Give us an opportunity to quote you our prices; we are certain you will find them attractive.

If you want THE VERY BEST QUALITY FOR THE LOWEST PRICE, send us your orders at once. All correspondence will have our immediate attention.

August Lotz Company, Boyd, Wis.

BE PREPARED!

BEES wintered better than for a number of years, due to mild winter. Early breeding will be heavy.

Be prepared for swarming. Do not lose the honey crop on account of lack of sections or extracting frames. Order before it is too late.

"falcon" quality has stood supreme for over 40 years. Write for our new red catalog. We guarantee safe arrival on all shipments.

W. T. FALCONER MANUFACTURING CO.
Falconer (near Jamestown), N. Y., U. S. A.
"Where the best beehives come from"

Guaranteed Hubam Clover

Annual White Sweet Clover

(Hughes Variety)

All of the annual white sweet clover seed of the 1920 crop was exhausted before May 1st. But seed of an early strain, planted in Texas after Christmas, 1920, began to reach maturity early in May. This seed is now available.

You can get it in time to test it this year. It blooms for bees in three or four months, and continues to bloom for a much longer period than most plants used for the purpose. Many beekeepers have declared it to be the greatest clover yet tried. It combines quick growth with an unusual wealth of honey-making blooms. It is also a legume that returns a large amount of plant food to the soils. It has frequently been described editorially by Gleanings in Bee Culture.

Big profits are possible growing seed for your neighbors, and the farmers and beekeepers of your locality.

The price is now $5.00 a pound. Order from the Henry Field Seed Co., Shenanodah, Iowa, or direct from the grower who guarantees.

The De Graff Food Company, Seed Dept. 303, De Graff, Ohio

BEE SUPPLIES

Root's Goods at Factory Prices
With Weber's Service

We carry several carloads of bee supplies, and are able to give prompt shipment at all times. Our motto is a customer must be satisfied; give us a trial and we will show you how quickly we will answer your correspondence; send your order and it will follow 24 hours after we receive it. Our new catalog is now ready; send for same. We have thousands of satisfied cutomers; why not you? Send a list of your wants and we will quote you.

C. H. W. Weber & Co.

2163-65-67 Central Ave., Cincinnati, Ohio.

Thagard's Italian Queens

Bred for Quality

My three-banded queens are bred from imported stock; they are hardy, prolific, gentle, disease-resisting and honey producers. A good queen is the life of any colony; head your colony with some of our queens, place our queens against any queens you may obtain anywhere, **and note the results.** I do not breed for **quantity,** but breed for **quality.** My queens have proven this to thousands of beekeepers that have tried them. Book your order now for May and June delivery.

April 1st to July 1st.

	1	6	12
Untested	$2.00	$8.00	$15.00
Select Untested	2.25	10.00	18.00
Tested	3.00	16.00	28.00
Select Tested	5.00	25.00	50.00

Safe arrival, pure mating, and perfect satisfaction guaranteed.
Circular free.

V. R. THAGARD - - - Greenville, Alabama

Forehand's Queens

They Satisfy---Why?

Because of 28 years of experimental work, with both queen-breeding and honey-production. With breeding and selecting of imported queens, I have reached a standard which is ideal. Queens as good, but none BETTER. Why experiment? Take advantage of the life experience of my breeders.

OUR SERVICE STATION—We are ready to serve you at all times, whether you desire queens or advice. Let us help you with your bee problems. All questions are cheerfully answered.

**I BREED
THREE-BANDED
ITALIANS
ONLY.**

June 1 to Nov. 1.	1	6	12
Untested	$1.50	$ 7.50	$13.50
Selected Untested.	1.75	9.00	16.50
Tested	2.50	13.00	24.00
Selected Tested	3.00	16.50	30.00

Bees in two-pound packages, 1 package, $6.00; 25 or over, $5.80; 50 or over, $5.40; 100 or over, $5.00, without queens. Will begin shipping bees as early as weather will permit.

Orders booked now for spring delivery. One-fourth the full amount with order and balance when shipment is desired. Pure mating, safe arrival, and perfect satisfaction guaranteed. Write for circulars and large-order discounts. Foreign orders at receiver's risk.

N. Forehand, Ramer, Alabama

THE

Southland Apiaries

W. S. TATUM, Proprietor

HATTIESBURG, MISS.

BY INDUSTRY WE THRIVE

Pure-Bred Italian Queens

From Root Home-Bred Queens

Orders filled in rotation unless date specified. Mating and Safe Arrival Guaranteed. Bees in Packages, Nuclei and Full Colonies.

QUEENS

Untested	$1.50 each	12 or more, $1.25 each
Tested	2.50 each	12 or more, 2.25 each
Select Tested	3.00 each	12 or more, 2.75 each

PACKAGES

1-lb. pkgs., no queen	$3.00 each	25 or more, $2.75 each
2-lb. pkgs., no queen	5.00 each	25 or more, 4.75 each
3-lb. pkgs., no queen	7.00 each	25 or more, 6.50 each

NUCLEI

Two-frame Nucleus, no queen	$4.50
Three-frame Nucleus, no queen	6.00

FULL COLONIES

Eight-frame colony, no queen	18.00
Ten-frame colony, no queen	20.00

Root Quality Bee Supplies

Airco Foundation

Prompt Service and Satisfaction Guaranteed.

ORDER NOW! BEE READY! STOCK UP! AVOID THE RUSH! BEGINNER'S OUTFITS A SPECIALTY.

DISCOUNT ON LARGE ORDERS

Time Is Money

You cannot afford to spend your time on any but
THE BEST BEES AND QUEENS.

Root Bees and Queens are second to none.

IF EXPERIENCE COUNTS—Fifty years' queen-breeding experience by Root experts should not be overlooked.

IF REPUTATION COUNTS—Root reputation, past, present, and future means much. The growth of the bee industry, dependent entirely upon better bees, is an item of much importance to the company offering you Root bees and queens. We cannot afford to sell anything but the best.

IF SALES RECORDS COUNT—Past sales tell their own story of the increasing demand for Root bees and queens.

THERE MUST BE A REASON.

ITALIAN QUEENS.—The season was early in Medina, and untested queens are available earlier than usual. Our breeding queens are selected with utmost care.

PRICES OF QUEENS.

Order by number.	June	July to Oct.
Catalog No. B312000—Untested queens	$2.50	$2.00
Catalog No. B313000—Select untested	3.00	2.50
Catalog No. B314000—Tested	3.50	3.00
Catalog No. B315000—Select tested	4.00	3.50

Write for discounts when lots of six or more are wanted.

NUCLEI.—A one, two, or three frame nucleus will make an astonishing record provided such a nucleus goes out, as ours do, on full worker combs in wired frames, well supplied with bees and the proper amount of brood.

Our nuclei are shipped by express in light wooden boxes with wire-screen top and bottom. It is necessary to have on hand hives into which to transfer the nuclei on arrival and then add frames containing full sheets of foundation to the nuclei as they increase in strength.

	Weight	June	July-Oct
Catalog No. B310100—1-frame Nucleus, no queen	4- 7 lbs.	$5.00	$3.50
Catalog No. B310200—2-frame Nucleus, no queen	9-12 lbs.	7.25	5.50
Catalog No. B310300—3-fr. Nucleus, no queen	12-16 lbs.	9.50	7.50
Catalog No. B310400—5-fr. Nucleus, no queen	22-27 lbs.	13.00	10.50

If queen is wanted, make a selection and add her price to the above

PRICE OF BEES BY THE POUND—SHIPPED BY EXPRESS.

	Wt.	June	July-Sept.
Catalog No. B310700—1-lb. pkg. of bees, no combs	3 lbs.	$5.00	$3.50
Catalog No. B310800—2-lb. pkg. of bees, no combs	5 lbs.	8.00	5.50
Catalog No. B310801—3-lb. pkg. of bees, no combs	7 lbs.	11.00	7.50

If queen is wanted, make a selection and add her price to the above.

THE A. I. ROOT COMPANY
WEST SIDE STA., MEDINA, OHIO

Do you want those supplies rushed to you right away? We will do our best to meet your needs. **TRY US.**

Let us help you get that crop of honey. Make it the biggest ever. It is up to you. **ORDER NOW.**

"What is so rare as a day in June? Then if ever come perfect days" with the busy bees buzzing of a sunny afternoon. They are busy making your honey. Have you done your part? How about foundation and supers ready for use?

ORDER NOW!

F. A. SALISBURY
1631 W. Genesee St.
Syracuse, N. Y.

New York State Beekeepers, send for our catalog.

You need a veil and gloves. It **DOESN'T PAY TO GET STUNG** either by the bees or in ordering supplies.

We are here to **SERVE** you. Shipments by **MAIL, EXPRESS,** or **FREIGHT.** Write us for quotations.

June---July---August

Are your months of harvest. If there is any way whatever in which we can be of assistance to you in making these months successful ones, and your honey yield highly satisfactory, call on us. We have a rounded stock, and can ship at once the supplies you need at this time.

Your order will get our immediate and individual attention. It will be shipped to you over the shortest possible route, saving you time and money.

Hives
Supers
Covers
Bottoms
Escape-Boards
Porter Escapes
Honey-Boards
Hoffman Frames
Shallow Frames
Tinned Wire
Root's Sections
Honey Containers
Smokers
The New Foundation—
AIRCO.

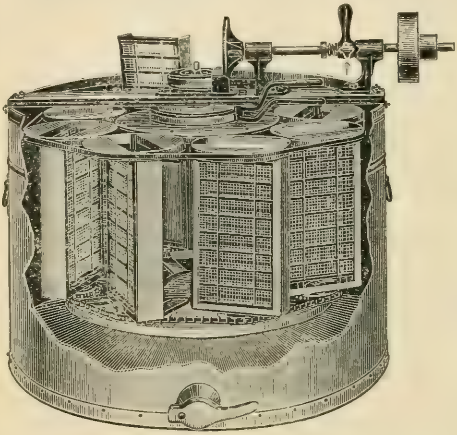
Our business---producing the Root Quality Goods.
Our specialty---service all the time.
Use us, in making these months pay.

The A. I. Root Company of Iowa

Council Bluffs, Iowa

Root's Power Honey Extractors

For Large or Small Producers



B472580—Buckeye Power Extractor. Permits reversing without stopping, as many times as desired

Whether you have fifty colonies or five hundred, and produce honey by the ton or trainload, you can hardly afford to be without a Root power extracting outfit. The power extracting machines now on the market are filling a long-felt want, especially where it is impossible or inconvenient to get extra or competent help while the honey flow is on. Many thousand pounds of honey are lost annually because beekeepers are unable to get help at just the right time or during the few days when the heaviest flow is on. The honey is there and must be made room for within a few hours or it is gone. With a power extracting outfit it is possible to take care of the entire crop with no loss of time or crop. More honey can be taken from the combs by this process, the combs are not so easily broken, and you can have them ready to put back into the hives before the flow is over. You can't always depend upon getting a man at the right time, but your power machinery is always ready to begin work just when you want it most. These machines are not expensive either in first cost or in operating expenses, and every beekeeper who produces extracted honey for the market should have one. Ask for our free booklet, "Power Honey Extractors."

Four Gallons of Gasoline Used in Extracting 33,000 Pounds of Honey.

I have used the power honey extracting outfit for the past two years, and am more than pleased with it in every way, as it has done perfect work, saving labor and time. The cost of running the engine is comparatively nothing, as I used only four gallons of gasoline in extracting 33,000 pounds of honey. A. A. Ericson.

Rockton, Wisc.

(Extracting may be made an interesting science instead of an irksome task if the proper machinery is used.)

Gasoline Does What Man Can Not Do.

I have no patience with the man who says, "Let the boy turn the extractor." Can't you remember when you had to turn the grindstone? Would you want to disgust the boy with beekeeping and farm life? On the other hand, consider the boy's love for machinery. Tell him he is to have charge of the engine, and note how he feels his importance. Won't beekeeping have new charms for him? Had I but forty colonies of bees the power outfit would be part of my equipment. It has come to stay with me. It pays. It gets the thick ripe honey out of combs. Does what man can't. E. W. Brown.

Morton Park, Illinois.

When the engine is not in use to run the extractor, it may be connected to some other machinery, and made to pay for itself many times over. Steam engines are expensive and complicated. A good gasoline engine may be run by any one with ordinary intelligence, and is not an extravagant investment.

The following sizes and styles of Root Power Extractors now ready for immediate shipment:

	Pockets	Gear ratio	Diam.	Wt.
B472425—Four-frame power extractor	9⅝ in.	1 to 1 friction	29 in.	255
B472440—Eight-frame power extractor	9⅝ in.	1 to 1 friction	37 in.	365
B472447—Eight-frame power extractor	12 in.	1 to 1 friction	43 in.	435
B472580—Eight-frame Buckeye power extractor.	9⅝ in.	1 to 1 friction	43 in.	597

Write us or any of our distributors today for current prices.

THE A. I. ROOT COMPANY, West Side Sta., Medina, Ohio.

Buy
Federal Farm Loan
Bonds

Farmers Should Buy Federal Farm Loan Bonds

FEDERAL Farm Loan Bonds are *safe*. They are secured by first mortgages on productive farms, the kind of assets with which you are already familiar, and in addition they are guaranteed jointly by the 12 Federal Land Banks with a combined capital of over $24,000,000.

Federal Farm Loan Bonds pay *5% interest*—a better *net* income than from most farms rented to tenants.

Federal Farm Loan Bonds are *tax-free*. The principal is exempt; likewise the income from it.

Federal Farm Loan Bonds are *staple*. They bring a steady, dependable income twice a year, good seasons and bad, are A-1 security for loans, and are easily and quickly convertible into cash.

Farmers who buy Federal Farm Loan Bonds help to build a farmers' national co-operative banking system. These bonds can be had in denominations of $100, $500, $1000 and $5000, either coupon or registered form.

Keep your money out of "blue sky" schemes. Put it where it will be safe and help to build up the whole farming business. Buy Federal Farm Loan Bonds and encourage your neighbors and farm help to buy them.

You can buy Federal Farm Loan Bonds from any Federal Land Bank

Springfield, Mass.
New Orleans, La.
Wichita, Kansas
St. Louis, Mo.
Berkeley, Cal.
Omaha, Nebr.
Louisville, Ky.
St. Paul, Minn.
Baltimore, Md.
Columbia, S. C.
Houston, Texas
Spokane, Wash.

Send today for free bulletin giving detailed information as to these bonds. Address the nearest Federal Land Bank. Talk it over with your county agent or secretary of your local national farm loan association.

FEDERAL FARM LOAN BOARD

TREASURY DEPARTMENT · WASHINGTON, D. C.

THE AULT 1921 BEE SHIPPING CAGE

(Patent Pending)

1st. It is a dark cage, much more so than the open screen cages we have been shipping in in the past.

2nd. The feeder uses pure sugar syrup. Better than Honey or Candy to ship on; it contains water as well as feed.

3d. Feeders are made more substantial, 1-3 larger, and have screw cap that will not jar out.

4th. Instead of one small hole, we now use a cotton duck washer in the screw cap that has proven to overcome all the objections found to the liquid feed method.

5th. The Cage is one piece screen wire protected by thin boards on the outside. Send for free circular describing the cage in detail, prices, etc.

QUEENS- PACKAGE BEES—QUEENS

Will book your order with 20 per cent down, balance just before shipping. My Free Circular gives prices in detail, etc. Safe delivery guaranteed within 6 days of shipping point. We ship thousands of pounds all over U. S. A. and Canada.

1-pound package bees, $3.00 each; 25 or more, $2.85 each.

2-pound package bees, $5.00 each; 25 or more, $4.75 each.

3-pound package bees, $7.00 each; 25 or more $6.65 each.

Add price of queen wanted.
F. O. B. Shipping Point.

1 Untested Queen, $2.00 each; 25 or more, $1.75 each.

1 Select Untested Queen, $2.25 each; 25 or more, $2.00 each.

1 Tested Queen, $3.00 each; 25 or more, $2.70 each.

1 Select Tested, $3.50 each; 25 or more, $3.00 each.

NUECES COUNTY APIARIES

E. B. AULT, Proprietor
CALALLEN, TEXAS

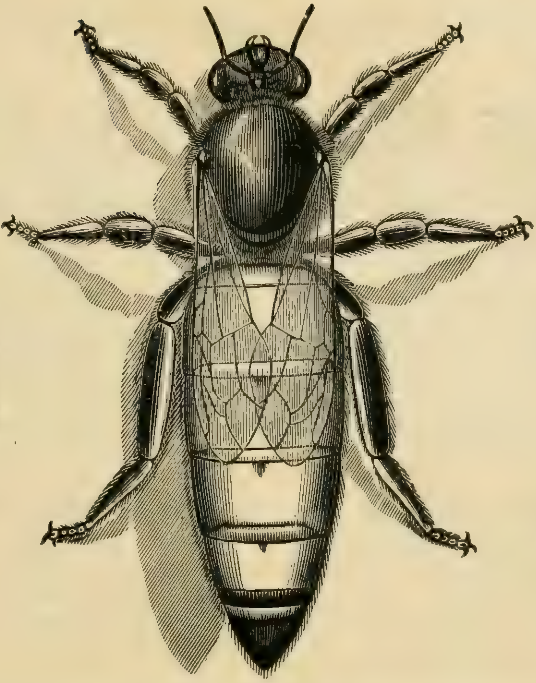
"Queens that are reared to please"

Highest Quality Prompt Service Satisfaction

THEY ALWAYS SATISFY

"Gentlemen:
"The six queens arrived today. I will say with pride they are the most beautiful I ever saw and I have been a beekeeper for 15 years."

We assure you they will satisfy you the same.



OUR PRICES

Untested: 1, $1.50; 6, $8.00; 12, $15; 100, $100. Select Untested, 1, $1.75; 6, $9.50; 12, $17; 100, $120. Tested, 1, $3.00; 6, $14.75; 12, $25.00. Select Tested, 1, $4.00; 6, $23.00; 12, $42.00.

Write for prices on larger quantities than 100.

Our Reliable Three-Banded Italian Queens

WHY ORDER FARMER QUEENS? They are bred by as skillful and experienced queen-breeders as can be found in the United States. There are very few places where queens are reared under as favorable conditions as in our queen-rearing yards. We devote our time to rearing as good queens as possibly can be, and we positively guarantee that no better can be reared; we spare neither labor nor money in developing our strain of Italians. It is our intention to improve our original stock each year and to be more skillful queen-breeders. Our first original stock was procured from the highest quality obtainable, which we have proved to be the highest point and is now not surpassed by any. Our own eyes inspect every queen that leaves our yards; no culls sent out. Place your orders, and after you have given our queens a fair test and you are not satisfied in every way that they are as good as any you have ever used, just return them and we will send you queens to take their places or return your money. They are very resistant to diseases, the very best for honey-gathering. You take no risk in buying our queens; safe arrival in U. S. A. and Canada; satisfaction is left entirely to purchaser; prompt service given to all orders; every queen guaranteed to be purely mated.

The Farmer Apiaries, Ramer, Alabama

Where the Good Queens Come From.

ITALIAN BEES AND QUEENS

Going Back to Normal

Our "motto" is to give beekeepers the very highest quality Italian Queens, Bees, and Beekeepers' supplies at the lowest cost possible. Conditions make the following low prices possible. An absolute quality guarantee on everything we sell. Our intention and desire are to stay in the business, and to stay we have got to give you quality goods, therefore you run no quality risk in ordering from us.

QUEENS AND BEES

UNTESTED QUEENS: $1.25 each; 12 or more, $1.00 each.

After June 15: Untested Queens, $1.00 each; 12 or more, 75c each.

TESTED, $2.00; BREEDERS, $5.00 to $25.00.

PACKAGE BEES for June shipment, shipped from from Mayhew, Miss., or Helena, Ga.:

One-pound package	$2.00
Two-pound package	3.75
Three-pound package	5.25

ONE, TWO, and THREE-FRAME NUCLEI at the above prices. Add price of queen wanted.

BEE SUPPLY SPECIALS

100,000 "A" grade sections in 4¼x4¼x1⅞, 4¼x4¼x1½, and 4x5x1⅜ at $15.00 per 1000.

SHIPPING CASES for above sections at 65c each. Quality as good as can be had.

A job lot of good CYPRESS COVERS and BOTTOMS of standard dimensions in packages of five, made of seven-eighths lumber thruout, at 55c each.

HOFFMAN FRAMES: Made of cypress at $6.00 per 100; white pine, best frame made, $8.00 per 100.

A lot of other bargains—let us quote you.

One of the Many Unsolicited Letters We Receive:

Alexandria, La., April 17, 1921.

The Stover Apiaries, Mayhew, Miss

Gentlemen: The shipment of beehives ordered of you sometime ago, received on the 15th instant.

I hasten to express my surprise: the extra good quality of the frames, extracting supers, and the cover is the best that I have ever used, tho I have supplies from more than ten different supply houses. I cannot understand how you can sell this grade of goods for the prices you are selling it. Your goods are by far the best that I have ever used. I have some covers that I paid $1.98 each for, and I think the one-piece cover that I paid $1.00 for from you is the best cover.

I have strongly recommended your goods to Mr. Day C. Patterson and Mr. M. G. Bennard of this City, who promised me that they would give you a trial order.

If you so desire, you may use this letter or any part of it for advertising purposes.

Hoping that I will have the occasion to give you a larger order in the future.

Respectfully yours,
W. S. JOHNSON.

115 Desoto St.

THE STOVER APIARIES

MAYHEW, MISS.

The Proof of the Pudding

How do we know AIRCO Foundation is better?

Just what are the tests that have been made?

Under what test conditions did the bees show a decided preference for AIRCO Foundation?

Since the tests were made thousands of beekeepers have proved to their own satisfaction that AIRCO delivers the goods claimed on the basis of these older tests.

But the results of these older tests are still to be seen in the actual frames as taken from the hives. Encased in glass, we keep on display these first testimonials by the bees.

In brood-frames we placed alternate strips of AIRCO comb foundation and strips of old-style foundation, both made from the same wax and at the same time and under exactly the same conditions.

With alternate strips of equal size of AIRCO and old-style foundation, the bees very decidedly showed a preference for the AIRCO; when the two strips of old-style foundation were placed in the center and the AIRCO foundation occupied the two outside quarter spaces of the frame, again the bees showed a decided preference for the AIRCO pieces.

When AIRCO pieces were twice the length of the old-style strips or when they were half the length of the old-style and vice versa, the results were still the same. Frames were put in all positions in many hives, but there was no trickery that could move the bees in their preference between old-style foundation and AIRCO foundation.

The superiority of AIRCO over other foundation in the imitation of natural comb is a matter of scientific demonstration that cannot be questioned.

When we state that AIRCO foundation is decidedly better than any other style of foundation, we mean just that and all of that.

We have not heretofore advertised in detail the tests made because it was our purpose that tests be made by the beekeeper himself. It has been and is our plea today, try AIRCO foundation this year, and judge results for yourself.

For your convenience we copy from page 21 of our catalog, order numbers and prices as follows:

	Price per pound packed in boxes as follows:							
	Medium Brood		Light Brood		Thin Super		Extra Thin Super	
One 1-lb. box.	B511001	$1.00	B521001	$1.03	B535001	$1.08	B545001	$1.10
One 2-lb. box.	B511002	.95	B521002	.98	B535002	1.03	B545002	1.05
One 5-lb. box.	B511003	.92	B521003	.95	B535003	1.00	B545003	1.02

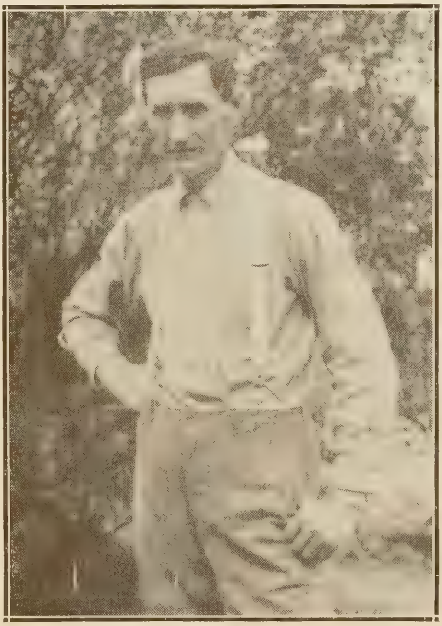
Immediate shipment will be made from our branches and agencies as listed on the back of the Root catalog, or your order mailed to Medina will be filled from our nearest branch or agency, saving you all possible transportation charges.

THE A. I. ROOT COMPANY. West Side Sta.. Medina. Ohio

Any Kicks---Kick Joe

OUR foundation mill man, "Joe," who has been with us for thirty-nine years, remarked the other day that we showed him the complimentary letters on "DADANT'S FOUNDATION," but never the "KICKS."

Fortunately criticisms come to us so seldom that we were unable to comply with his desire for adverse criticisms of his and our product.



"JOE" SAUGIER

Joe started working in the Dadant factory when the whole process was by hand.

Boards were dipped in hot wax, the resulting sheets piled to cool, and eventually milled on hand mills. Foundation trimming, papering, lumber sawing, boxing, all were done by hand.

During Joe's time enough Dadant's Foundation has been made to fill two million hives and 150 million sections, if every one had used full sheets.

The sheets, if placed end to end, would reach from New York across the Atlantic, through Europe and Asia, thence across the Pacific to San Francisco.

We invite letters of honest criticism on Dadant's Foundation. Joe wants them, we want them, that we may, if possible, increase the value of our product to the beekeeper and his bees. This follows our policy of continuous improvement of DADANT'S FOUNDATION.

Comparison of DADANT'S FOUNDATION with others from the mill or under test in the hive invited.

DADANT'S FOUNDATION
Every inch, every pound, every ton equal to any sample we have ever sent out. Specify it to your dealer. If he hasn't it, write us.

Dadant & Sons

Hamilton, Illinois

Catalog and Prices on Bee Supplies, Beeswax, Working Into Comb Foundation, and Comb Rendering for the Asking.

Massachuset
JUL 5 - 1921
Agricultural
College

Gleanings in Bee Culture

One of the pleasures of a beekeeper's life is the trip home from an outyard after a hard day's work.—*Morley Pettit.*

VOL. XLIX JULY, 1921 NUMBER 7

We are now running 1000 Colonies for Queens and are prepared to accept orders for Queens in large quantities and make immediate delivery. Each Queen selected and prepared for mailing by our Queen-breeder personally. They are going out in every mail, and to have yours in time to use them this season better get your order in the next mail. Also let us have your list of supplies, so we can quote you our very best prices.

MILLER BOX MANUFACTURING COMPANY
201 North Ave. 18.
Los Angeles, California.

"Griggs saves you freight."

TOLEDO

By the time you read this our 1921 crop will be history. How about your Honey Cans, Comb-honey Cases, Extractors? Let us know your wants. We can serve you promptly and well.

Honey, New Crop

Send sample and say how much you have, kind, how packed, and price asked in first letter.

Beeswax always wanted.

THE GRIGGS BROS. CO.

Dept. 25 Toledo, O.

"Griggs saves you freight."

The Old Reliable Three-Banded Italians

Booking orders now for 1921 Queens ready April 1st. My Italians are of an exceptionally vigorous and long lived stock strain of bees. They are gentle, prolific, very resistant to foul brood, and the best of honey-gatherers. I have sold a good many queens to parties who are using them in stamping out foul brood. Orders booked for one-fourth cash, balance before delivery. Will guarantee safe arrival in the United States and Canada. Descriptive circular and price list free.

	Prices April, May, and June			July to November		
	1	6	12	1	6	12
Untested	$1.50	$8.00	$15.00	$1.25	$6.50	$12.50
Select Untested.	1.75	9.00	16.00	1.50	8.00	15.00
Tested	2.50	12.50	24.00	2.25	12.00	22.00
Select Tested	3.00 each			$3.00 each		

No nuclei or pound packages of bees for sale.

JOHN G. MILLER

723 C Street
Corpus Christi, Texas

Further Reduction

In order to further reduce our stocks before taking inventory July 31, we are making a reduction of 10% from latest prices on frames, hives, supers, foundation, honey extractors, and other Eastern goods.

Buy now and save money!

THE A. I. ROOT COMPANY OF CALIFORNIA

Los Angeles: 1824 E. 15th St. San Francisco: 52-54 Main St.

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THE A. I. ROOT COMPANY, Publishers, Medina, Ohio

Editorial Staff

Geo. S. Demuth and E. R. Root	A. I. Root	Iona Fowls	H. G. Rowe
Editors	Editor Home Dept.	Assistant Editor	M'n'g Editor

YOU KNOW THIS IS THE BEST VEIL.
Don't Do Without.

$1.50 will bring this veil to you direct from us or any of the G. B. Lewis distributors. We give you this GUARANTEE: If, after you receive you Ideal bee-veil, it is not the best veil you ever hope to own, return it and your money will be returned to you and we will still be good friends. Buy an extra one for your wife; she deserves the BEST and it will make her happy.

AFTER ALL IS SAID AND DONE

You, I, and the next fellow will be better off and happier when prices in all commodities seek the same level. When a pound of honey bought a loaf of bread, we were happy. Even though the loaf cost 15c it did not anger us because honey advanced to the same level. Let us not judge the present conditions as ''unfair''; we are simply returning to the price of bread we used to know. The other prices will eventually seek the same level.

Send for our REDUCED prices on Bee Supplies. Our reduction is as much as ⅓ off of 1921 prices.

We expect to buy a limited quantity of honey during the summer months. Send a sample and tell us what you want for it. If we can get together, your check will follow the day your shipment is received.

Old Combs and Cappings rendered into wax. Bag or box it, address to us, and mark the Bill of Lading, ''Wax Refuse''; this takes the lowest freight rate. We pay market price for the wax less 5c per pound rendering charges. Do it before the ''wax moths'' do it for you.

THE FRED W. MUTH CO.
Pearl and Walnut Sts. *Cincinnati, Ohio*

"SUPERIOR" FOUNDATION

Yes, we are ready for the rush. Many tons now ready for shipment, and our machines are running to utmost capacity. Use the best. If your dealer can't supply you, write us for price, stating quantity required. We also accept beeswax for foundation or supplies.

''Everything in Bee Supplies''

SUPERIOR HONEY COMPANY
OGDEN, UTAH.
(Manufacturers of Weed Process Foundation)

Indianapolis Can Give You Some Real Beekeeping Service

We ship your order the same day it is received. Let us give you some of this service. Catalog for the asking. Write for prices on beeswax.

THE A. I. ROOT COMPANY
873 Massachusetts Avenue, Indianapolis, Ind.

A Superior Quality
At Less Cost

SUPPLIES

A Superior Quality
At Less Cost

A 15 Per Cent Reduction in Prices

Our campaign to secure lower prices on supplies has been successful. Our beekeeper friends have been writing us complaining bitterly of the high prices of supplies charged by most supply manufacturers. Knowing their attitude to be right we have made continuous efforts to get the prices of supplies down.

The Diamond Match Co., whose agents we are, now write us in regard to our efforts, "Remember that you have the assistance and help of the Diamond Match Co. solidly behind you, and that we are in the supply business to stay."

We are glad to pass on this good news and a 15% reduction to our beekeeper friends.

Deduct the 15% from prices listed below, when ordering.

Hives, Supers, etc., listed below are in the flat, and are complete with Hoffman frames, nails, metal rabbets, and all inside fixtures.

One-story Dovetailed Hive

Five 8- frame	$16.00
Five 10-frame	16.90

Shallow Extracting Supers

Five 8-frame	$6.00
Five 10-frame	6.50

Standard Hoffman Frames

100	$8.50
500	40.00

Full-Depth Supers

Five 8-frame	$8.00
Five 10-frame	9.00

No. 1 Style Comb Honey Supers

Five 8-frame	$5.75
Five 10-frame	6.25

Shallow Extracting Frames

100	$6.70
500	32.50

Prices on Our Incomparable Quality Foundation are Net.

Medium Brood	Thin Super	Light Brood
5 lbs...74c per lb.	5 lbs...80c per lb.	5-lb. lots 76c per lb.
25 lbs...73c per lb.	25 lbs...79c per lb.	25-lb. lots 75c per lb.
50 lbs...72c per lb.	50 lbs...78c per lb.	50-lb. lots 74c per lb.

Especially prepared Beehive White Paint, one-half gallon cans, $2.10.

Hoffman & Hauck, Inc.

Woodhaven, New York

HONEY MARKETS

Just as we go to press (June 22) there are reports of some large deals in honey in California. The shortage of crop there is doubtless responsible for this activity—to get sage and orange when they can be had.

There has been a fair to good crop of clover honey in Ohio and Michigan. The yield in the bordering states will not be quite as good on account of less rain.

The A. I. Root Company.

U. S. Government Market Reports.

SHIPPING POINT INFORMATION FOR FIRST HALF OF JUNE.

CALIFORNIA, Los Angeles.—Supplies of white sage, light amber, and white orange light, other varieties heavy. Light wire inquiry. Movement very slow, market dull, little change in prices. Carloads f. o. b. usual terms at loading point, white orange, new crop 12-12½c; old crop, no sales reported; light amber alfalfa old crop 5½-6c, new 6-6½c; white sage best 12-12½c, light amber sage, no sales reported. Hawaiian, white 6c, light amber 5½c. Beeswax, in less than carlots, light 30-33c, dark 26-28c per lb. Alfalfa crop is now estimated normal, orange 25% and sage at 30% of normal.

INTERMOUNTAIN REGION, Idaho and Utah. —Shipments have been moderate, with little or no inquiry for carlots. The supplies in some sections are practically all sold. White sweet clover is reported at 7 to 8c for carloads f. o. b. usual terms at loading points; light honey is bringing 8c in l. c. l. lots. Comb No. 1 is selling in a small way direct to retailers at 6.50-7.00. Dealers are paying beekeepers for good quality light honey 7½c per lb. The bees are reported in fair condition; considerable quantities have been brought in from California.

CENTRAL AND MIDDLE WESTERN STATES. —The crop prospects in Wisconsin are fair, the alsike clover is good, and after that the basswood, which is now well set with buds, will be on. The honey flow has just started. No honey is reported moving. A few sales by beekeepers of beeswax are reported at 26c in cash and 29c in trade for best stock. In Ohio the bees are reported as working well, and prospects are good for a full crop. A few sales of extracted clover in small lots are reported at 15c per lb.

SOUTHEASTERN SECTION. — Shipments are very light, with practically no sales reported. Shippers are quoting extracted light amber at 55c per gal. The crop outlook is below normal, due to bad weather conditions. The hives are reported in good condition.

NORTHEASTERN SECTION.—Bees are reported in generally good condition, but some foul brood is noted. Considerable clover honey is now in the hives, with a new lot of white clover plants commencing to yield, and sweet clover starting to bloom.

TELEGRAPHIC REPORTS FROM IMPORTANT MARKETS

DENVER.—Market continues quiet. Demand and movement very light. Sales to jobbers, per lb., extracted: Colorado, white 11-13½c, light amber 10½-12¾c, amber 10c. Comb: Colorado 24-section cases No. 1, white $6.08; No. 2, $5.63.

BOSTON.—No arrivals reported since last report. Very light movement in all lines with prices practically unchanged. Comb: Sales to retailers, New York, 24-section cases white clover No. 1 heavy $8.50-9.00, light $7.00-7.50; Vermont, 20-section cases white clover No. 1, 8.00-8.50; light, $7.00-7.50. Extracted: Sales to confectioners and bottlers, Porto Rico, amber per gal., 80-85c; California, per lb. white sage, 15-16c; few small lots high as 18c. Brokers' nominal quotations in l. c. l. lots to dealers and bottlers delivered at Boston: California, per lb. white sage, 12c; light amber alfalfa, 9c; amber alfalfa, 7-8c. No sales of beeswax reported.

CHICAGO.—Arrivals since last report, 2 cars from New York, consisting African and Hawaiian and approximately 2,000 lbs. Minn., 1,500 lbs., Nev., 3,000 lbs. Ia., 5,000 lbs. Colo., 3,000 lbs. Calif. Market dull and prices irregular. Dealers who have merchandise stock trying to maintain prices, but commission stock is lowering prices and there is very little f. o. b. buying at present. Feeling for future rather pessimistic. Extracted: Sales to bottlers, Colorado, Utah, and California, per lb. light amber 8½-9¼c. Comb: Sales to retailers, Minnesota, Iowa, and Nevada, 24-section cases alfalfa No. 1, best heavy, 6.50-7.00; light weight, discolored, $5.00-6.00. Beeswax: Receipts moderate, market dull, trading slow. Sales to harness-makers, wholesale druggists, etc., Oklahoma, Montana, and Missouri, per lb.: light, 30-31c; dark, 28c; African, refined, 25c.

CINCINNATI.—1 car Utah arriver. On account of the refusal of the principal honey and beeswax receivers to furnish the information necessary to report market conditions and prices in Cincinnati accurately and completely, no report can be published for this important honey and beeswax center.

CLEVELAND.—No carlot arrivals. Practically no demand, movement slow, no change in prices. Dealers quote extracted: In 5-case lots or more per lb. western white sweet clover, 11-12c.

MINNEAPOLIS.—No carlot arrivals since last report. Extracted: Supplies light. Practically no demand, market weak, no sales reported.

KANSAS CITY.—No carlot arrivals since last report. Demand and movement moderate. Sales to jobbers, extracted: Supplies moderate, market slightly stronger. Per lb., Utah, extra light amber, 11c. Comb: Supplies light, market steady. Colorado, 24-section cases No. 1 white, $6.00-6.50.

NEW YORK.—Domestic l. c. l receipts light. South American and West Indian receipts limited. Supplies moderate. Demand and movement light, market dull, few sales. Extracted: Sales to jobbers, wholesalers, confectioners, bakers and bottlers, domestic, per lb. California, light amber alfalfa, 8-9c; white orange blossom and white sage, 12-13c. West Indian and South American, refined, best mostly 5½-6c per lb.; or 55-60c, few, 65c per gal. Comb: No supplies. Beeswax: Foreign receipts limited. Supplies moderate. Demand and movement light, market dull. Spot sales to wholesalers, manufacturers, bleachers and drug trade, per lb. South American, crude light, 26-28c; slightly darker, 24-26c; dark, 16-18c; African, dark, 16-18c.

PHILADELPHIA.—Practically no demand or movement, market very dull on account of low prices of sugar. Bulk per barrel, very few sales to bakers, extracted: Per gal., Porto Rican, amber, 57c; San Domingo Mexican, light amber, quoted 60-65c, no sales. Beeswax: Practically no demand. market dull. Sales to manufacturers, per lb. South American, 26-28c; African, dark, 17c.

ST. LOUIS.—Comb: No receipts reported. Practically no demand, market very weak. No actual or nominal market established. Extracted: No receipts of new honey reported as yet. Supplies of old stock liberal. The market is weak. No sales made to establish any prices. Beeswax: Very light receipts and light supplies. Demand good, but movement limited on account of supply. Floor wax and other manufacturers reported to be on the market for stocks. Sales to jobbers, per lb. southern, ungraded average country run wax, market is firm at around 25c.

GEORGE LIVINGSTON
Chief of Bureau of Markets.

Special Foreign Quotations.

LIVERPOOL.—During the past month there has been a fair demand for Chilian honey for export. There have been about 700 barrels sold. There are inquiries for Cuban and West Indian honey but no offers. The value of extracted honey in American currency is about 8c per lb. The value of beeswax at today's rate of exchange is about 23 cents per lb. Taylor & Co.
Liverpool, England, June 2.

CUBA.—Honey today sells at 40c a gallon.
Matanzas, Cuba, June 7. Adolfo Marzol.

Opinions of Producers.

Early in June we sent to actual honey producers, scattered over the country, the following questions:

1. How does the honey flow in your locality compare with normal at this time? Give answer in per cent.
2. What is your estimate as to what the total crop will be for 1921 compared with normal, the estimate being based upon the yield to date as well as the present condition of the honey plants and the colonies. Give answer in per cent.
3. What percentage of last year's crop still remains in the hands of the producers?
4. At what price do you expect the new crop to move in large lots in your market? Comb honey? Extracted honey?

State.	Reported by	Honey Flow	Crop	On Hand	Price Comb	Price Ext.
Ala.	J. M. Cutts....	80	90	25	$.20	
Ark.	J. V. Ormond.	100	100	0	.25	$.22
Ark.	Jas. Johnson...	100	100	0	.27	
B. C.	W. J. Sheppard.	100	100	0	.35	.28
Cal.	L. L. Andrews.	20	25	30		.12
Cal.	G. B. Larinan..	8	15	20		
Cal.	M. A. Sayler...	90	100	0		
Colo.	J. H. Wagner..	100	150	25	6.00	.16
Colo.	B. W. Hopper..	90	90	5	5.00	.10
Conn.	A. Latham.....	200	150	5	6.00	.20
Fla.	Ward Lamkin..	100	100	5		.10
Fla.	Harry Hewitt..	10	75	25		.11
Fla.	C. E. Cook....	75	75	5	.20	.15
Fla.	C. H. Clute....	5	60	0		
Ga.	J. J. Wilder...			20	.19	.14
Ida.	E. F. Atwater..		100		6.00	.12
Ill.	A. C. Baxter..	25	40	0	.30	.22
Ill.	C. F. Bender..	20	30	0		
Ill.	A. L. Kildow..	15	5	10	.25	.20
Ind.	T. C. Johnson..	70	100	0	6.00	.20
Ind.	E. S. Miller...	90	90	20	7.00	.17
Ia.	Ed. G. Brown..	100	100		.22	.12
Ia.	F. Coverdale...	10		2		
Kan.	J. A. Nininger..	75	50	0	7.00	.20
Kan.	C. D. Mize....	100	80	0	7.00	.15
Ky.	P. C. Ward....	70	75	0		
La.	E. C. Davis....	50	50	10		
Me.	O. B. Griffin...	25		5	.31	.28
Mass.	O. M. Smith...	50	50	5		
Md.	S. J. Crocker, Jr.	25	25		.25	.15
Mich.	B. F. Kindig...	100	100	7		
Mich.	F. Markham....	100	75	25	.30	.15
Minn.	C. Blaker......	75	75	25		
Miss.	W. Elam.......	50	65	10		.12
Miss.	R. B. Willson..	85	80	2	.30	.11
Mont.	R. E. Bray.....	95	95	10	5.00	.16
Neb.	F. J. Harris....			9		
N. H.	W. H. Wolff...	100	100	0	8.00	.20
Nev.	L. D. A. Prince	0	50	10	5.00	.12
Nev.	E. G. Norton...			5		.10
N. J.	E. G. Carr....	50	75	5		
N. Y.	Geo. B. Howe..	10		0		
N. Y.	Adams & Myers				.23	.13
N. Y.	Geo. H. Rea...	50	50			
N. Y.	O. J. Spahn....	50	50		.30	.20
N. Y.	N. L. Stevens..	50	75	15	.18	.10
N. Y.	F. W. Lesser...	75	50	0	5.00	.11
Ohio	E. G. Baldwin..	85	75	8	.17	.13
Ohio	F. Leininger....	100	100	0	.25	.15
Ohio	R. D. Hiatt....	100	85	0		
Ohio	W. A. Matheny..	10	10	0	.40	.40
Okla.	C. F. Stiles....	90		0		
Ore.	E. J. Ladd.....	90	75	9	.21	.10
Penn.	Harry Beaver...	50	40	0		
R. I.	A. C. Miller....	40	100	0		
S. C.	A. S. Conradi...	50		0		
Tenn.	G. M. Bentley..	100	100	0	.30	.25
Tenn.	J. M. Buchanan	90	100	0	.25	.20
Tex.	T. A. Bowden..	100	100	0	.26	.18
Tex.	J. N. Mayes....	50	50	0	.14	.10
Utah	M. A. Gill.....	100	100	0	4.00	.09
Utah	N. E. Miller....	105	108			.08
Vt.	J. E. Crane....	80	10	0	.25	.15
Wash.	G. W. B. Saxton	50	150	10		.15
Wash.	W. L. Cox	100	100	0	.25	.15
Wash.	G. W. York....	105	75	5	5.00	.12
W. Va.	T. K. Massie....	0	0	0		
Wis.	N. E. France...		85	10		
Wis.	E. Hassinger....	80	60	2	.23	.13

THE HONEY SITUATION IN THE UNITED STATES.

Los Angeles, Calif., May 24.—It is only recently that the honey industry has become a specialized, important industry in the United States. This development has taken place almost entirely in the State of California and is to a great extent the result of the activity of co-operative marketing associations.

Heretofore, statistics as to honey production and consumption in the United States have been almost negligible, because of the fact that the production of honey was maintained as a sideline by the average agriculturist. The development of the honey industry upon a scientific commercial basis has created the necessity for accurate information as to honey production, and for a careful scientific analysis of the honey situation. As a consequence, the Research Department of the First National Bank of Los Angeles and the Los Angeles Trust and Savings Bank has undertaken a careful study of the honey situation in the United States and the State of California. While it has been impossible to secure as detailed information as might be desired, because accurate statistics have not been maintained in the past, it has, nevertheless, proved possible to secure a considerable amount of accurate data with regard to the industry.

California produces approximately 15 per cent of the honey produced in the United States of America. Iowa is the second state, producing 6 per cent of the entire crop of the United States. New York, Illinois, Michigan, and Wisconsin each produce approximately 4 per cent, and Pennsylvania, Georgia, Florida, Ohio, Indiana, Missouri, and Colorado 3 per cent. No other state produces more than 2 per cent of the entire honey supply of the United States.

California alone markets the major proportion of its honey production outside of the State in which it is produced. As a general rule from 70 to 90 per cent of the commercial honey produced in California is marketed outside of the State and from one-third to one-half of the honey marketed outside of the State in which produced is California honey.

Careful estimates as to commercial honey production in California during the past twenty years are given below:

Year.	Pounds
1900	2,208,000
1901	8,112,000
1902	5,125,000
1903	8,400,000
1904	1,040,000
1905	10,000,000
1906	4,510,000
1907	7,120,000
1908	4,524,000
1909	11,532,000
1910	4,080,000
1911	9,500,000
1912	4,710,000
1913	3,720,000
1914	7,950,000
1915	9,360,000
1916	8,100,000
1917	6,500,000
1918	5,500,000
1919	6,350,000
1920 (not final)	9,500,000

It is impossible to secure accurate figures as to total honey produced in the United States of America. However, the Chief of the Field Service of the Department of Agriculture estimates that 180,000,000 pounds will approximate the total honey production in the United States during 1916 and states that it is his belief that these figures are within 10 per cent of the actual production. Upon this basis it is estimated that the total production for the United States was about 150,000,000 pounds in 1917, 180,000,000 pounds in 1918, 210,000,000 pounds in 1919 and 250,000,000 pounds in 1920. It may be, however, that the 1920 production of honey in the United States totaled as much as 300,000,000 pounds. This is the estimate made by Dr. E. F. Phillips, Apiculturist of the Bureau of Entomology.

Commercial honey is produced almost exclusively in the form of extracted or bulk honey, altho there are three forms in which honey enters the commercial market. Next in importance to extracted honey is comb honey and there is a small amount of chunk honey sold upon the market. By chunk honey is meant that honey which is sold in the

(Continued on page 468.)

Buckeye Packed Hives
Bee Books
Bee Gloves
Section Honey Boxes
Bee Veils
Honey Extractors
Feeders
Bees
Beginner's Outfits
Gleanings in Bee Culture
Frames

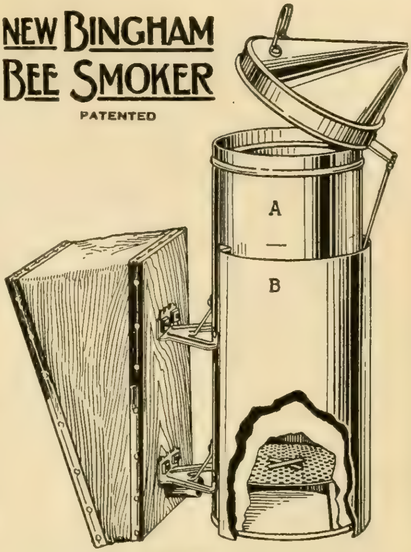
Queen Excluders
Queen Rearing Outfits
Honey Tanks
Standard Dovetailed Hives
Honey Labels
Hive Parts
Smokers
Comb Foundation, Airco Brand
Wax Presses
Capping Melters
Queens

"And they are all Root Quality"

M. H. Hunt & Son
Lansing, Michigan
510 North Cedar Street

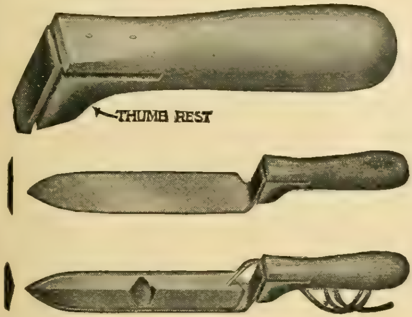
Send for 1921 Catalog.

Buy Bingham Bee Smokers



On the market over 40 years. The bellows of best quality sheepskin is provided with a valve, which gives it pep and makes it respond quickly to the most delicate touch, giving as much or as little smoke as is required. The Big Smoke size, stove 4 x 10 inches, with asbestos-lined shield, permits the holding of the smoker between the knees without danger of burning the trousers or one's legs. This size is much appreciated by extensive operators.

Postage extra.	Size of stove, ins.	Shipping wt., lbs.
Big Smoke, with shield	4 x10	3
Big Smoke, no shield	4 x10	3
Smoke Engine	4 x7	2¼
Doctor	3½ x7	2
Conqueror	3 x7	1¾
Little Wonder	3 x5½	1½

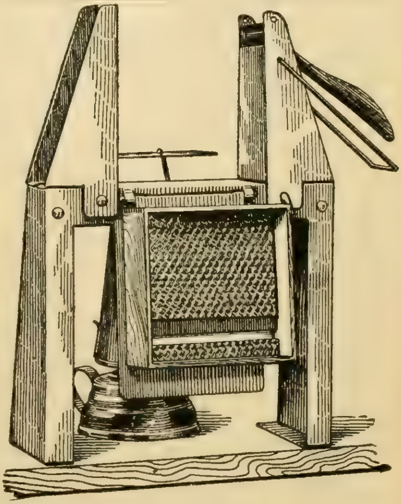


Buy Bingham Honey Uncapping Knives

Made of the finest quality steel for the purpose that money can buy. These knives of the proper thickness and quality have given the best of satisfaction, as the old timers will testify. For over thirty years the men engaged in the manufacture of these knives have been at this work. The perfect grip cold handle is one of the improvements.

Buy Woodman Section Fixer

A combined section press and foundation fastener of pressed steel construction. It forms comb-honey sections and puts in top and bottom starters all at one handling. Top and bottom starters insure combs attached to all four sides, a requirement to grade fancy. By using this machine you always handle large pieces of foundation. The difficulty of handling the small bottom starters is eliminated, which is not the case with other machines. The section comes away right side up, with the large starter hanging down, which is a decided advantage in rapid work, especially in hot weather.



SPECIAL SALE HONEY PACKAGES.

60-lb. cans, 2 in a case, per case in quantity lots, f. o. b. Chicago, at $1.30; Detroit, at $1.30; Baltimore, at $1.25. Friction-top pails, f. o. b. Chicago, 5-lb. size, crates of 100 at $7.75; crates of 203 at $15.00; 10-lb. size, crates of 113 at $12.50. F. o. b. Baltimore, 5-lb. size, crates of 100 at $7.50; 10-lb. size, crates of 100, at $11.00. Clear flint glass Mason jars with lacquered tin caps and wax liners, pints per gross at $9.00, quarts per gross at $10.00. Quotations on other packages made on request.

A. G. Woodman Co., Grand Rapids, Mich., U. S. A.

NOW IS THE TIME

when every minute counts, for you as for your bees. You know, Mr. Beekeeper, the great saving of a drawn comb over a sheet of foundation.

Just so, there must be a saving, when the bees draw out foundation without hesitancy. DADANT'S FOUNDATION is such a product, so received by the bees.

Combs are drawn once for all. Make sure the foundation you furnish your bees insures as nearly perfect combs as is possible.

There is a satisfaction in driving a good horse or a good car. Just so with giving your bees a good foundation.

Remember, **Dadant's Foundation** is the result of years of patient experimentation combined with extensive use in our own apiaries.

We send out **no product** which has not proven its superiority by actual test in our many apiaries.

DADANT'S FOUNDATION—Every inch, every pound, every ton equal to any sample we have ever sent out. Specify it to your dealer. If he hasn' it, write us.

PRICE REDUCTIONS.

We announce the following reductions from our 1921 catalog prices.

Dadant's Foundation, 12c per pound.
32% discount on Lewis Famous No. 1 sections.
30% discount on Bee Hives and all other wooden goods.
25% discount on Bee Veils and wood and wire excluders.
20% discount on Bees and Queens and all other excluders.
10% discount on Honey Extractors and metal goods.
Special low prices on Tin Cans.

Immediate shipment. Order NOW.

DADANT & SONS

HAMILTON, ILL.

Catalog and Prices on Bee Supplies, Beeswax, Wax Working into Comb-Foundation, and Comb Rendering for the asking.

GLEANINGS IN BEE CULTURE

JULY, 1921

EDITORIAL

Best Time for Requeening.

JULY is an excellent time for requeening. By replacing inferior queens now with young queens carefully reared from the best stock, the beekeeper should add many dollars to his income next year. If these young queens can be reared during the latter part of the honey flow in July as can usually be done in the North, they will begin to lay just at the right time to help insure a good colony for winter. A young queen that begins to lay in August not only puts the colony in much better condition for winter by laying more eggs late in the season than old queens, but she is also in prime condition for the heavy brood-rearing next spring in building up for the honey flow. Many beekeepers are so busy with their crop of honey at this season that they think they cannot afford to take the time to rear queens to replace old and inferior ones, but it usually pays and pays well to take the time to do this.

* * *

Price of Beeswax Abnormally Low.

OWING to the present rate of foreign exchange and the lack of a market in Europe, immense quantities of beeswax are being dumped upon the market in this country at heretofore unheard-of prices, which is depressing the market on domestic wax. Just how long this dumping will continue no one can tell, for under present conditions, even a high protective tariff could not be expected entirely to prevent it.

This wax is not able to compete with domestic wax for all uses on account of being an inferior grade, altho pure. This will prevent the price of domestic wax from sinking to the same level as the foreign wax, which comes originally chiefly from Africa, and domestic wax is holding up remarkably well under this pressure.

Fortunately beeswax is not a perishable product and does not have to be rushed to market when the price is low. Furthermore, by using comb foundation the beekeeper is both a producer and a consumer of wax. Many and perhaps most of them are larger consumers than they are producers.

The Dr Miller Memorial Fund.

THIS is growing slowly; but owing to the general economic conditions over the country the amounts subscribed are small — seldom more than a dollar, and often less. This morning, June 10, the Alameda County Beekeepers' Association of Oakland, Calif., a real live bee society, by the way, thru its president, Cary W. Hartman, sent a check for $35.00. The association expressed the wish that we might be able to establish a chair in bee culture at some college; but, unless the funds come in much heavier than they have been doing, this would not be possible, tho we could put up a monument or establish a small bee library. The action of the association is splendid, and we hope that other organizations of a like character, state and county, will follow the example. In the meantime let individual subscriptions continue to come in as before.

* * *

Effects of the Break in Brood-Rearing in May.

THE heavy brood-rearing in April in many of the northern States this year has brought on certain conditions not often encountered in this portion of the country. Many colonies had as much brood the first of May as they usually have the first of June, and after climbing to the peak of brood-rearing a month or more earlier than usual they greatly reduced brood-rearing in May. Apparently after a spurt of such heavy egg-laying the queens must have a rest, not being able to keep up the pace for any great length of time. Many queens were superseded late in April or early in May, and many of the early swarms, which came a month ahead of the usual time for swarming, were a result of supersedure.

During May the colonies, having their spurt of spring brood-rearing over with, reared brood sparingly even when abundantly supplied with stores, and in colonies short of stores the queens in many cases almost suspended egg-laying entirely, just at the time that spring brood-rearing is usually at its height. Even stimulative feeding at this time could not be depended upon to keep up brood-rearing as extensively as it had been carried on earlier. There was, therefore, a break in brood-rearing for two or three weeks in May, which has resulted in a lack of the usual number of emerging bees in June.

When the honey flow began from clover about the first of June this lack of young bees was quite noticeable, for when most of the field bees were in the field during the day, the hives appeared to be almost deserted, the majority of the workers being old enough to work in the fields. Another peculiar thing brought about by this condition was noticeable in the supers, when the field bees were in the hive in the evening or during a shower. Instead of the supers being occupied largely by young bees they were apparently filled with old bees, which usually stay in the lower part of the hive when the supers are occupied by young bees.

Under these conditions there should be but little if any swarming until young bees begin to appear again in great numbers. The usual June swarming season should therefore make its appearance late in the month and probably extend into July, altho most colonies that were well supplied with stores were unusually strong when clover began to yield. Beekeepers of the northern States are so accustomed to the swarming season coming soon after the beginning of the honey flow that it is quite a novelty to see rousing colonies send most of their workers into the fields and the supers, with no thought of swarming.

Leave More Honey For the Bees.

EVEN the experienced beekeeper usually overestimates the amount of honey on the hives toward the close of the honey flow, and in producing extracted honey the tendency is to leave too little for the bees. In many cases colonies run short of stores in August after the crop has been removed where there is no fall flow.

With the depressed honey market it would be folly to extract honey which may not find ready sale except at a low price, expecting to feed the bees sugar syrup for their own use. It is far better to leave enough honey in the combs now to supply an abundance for the use of the bees until next season. The beekeeper cannot afford at this time to trade sugar stores for honey with all the risk and trouble that would result from making such an exchange, to say nothing of the advantages of honey stores for brood-rearing in building up next spring. The wise beekeeper will leave more honey with the bees than he thinks they can possibly need when he removes his crop.

Beekeepers in the far North can feed their colonies a sufficient amount of sugar syrup for the time the bees are confined to their hives to insure good stores for the winter period, but this should be fed late after brood-rearing ceases and should be given in addition to the honey stores which will be available for spring brood-rearing after the bees have consumed the late-fed sugar stores. By using but little, if any, sugar for feeding the bees, and leaving honey instead, the total amount of honey thus kept off of the market should be enormous and should greatly help to relieve the present depressed honey market. It is time for beekeepers to cease helping the sugar market at the expense of the honey market.

Production Costs of Comb and Extracted Honey.

THE present high prices of equipment and greatly increased operating expenses, together with the lower prices of honey, are causing beekeepers to think seriously of the cost of producing honey. M. G. Dadant, in the American Bee Journal, sets forth some interesting figures on production costs of comb and extracted honey. From these figures, which were compiled by Frank Rauchfuss, Mr. Dadant concludes that it would take a production of 100 pounds per colony of extracted honey to net the producer as much as a production of 48 pounds of comb honey per colony, figuring supplies at prices prevailing when the 1920 crop was harvested. The figures were compiled on a basis of 500 colonies in eight-frame hives for comb honey and the same number of colonies in ten-frame hives for extracted honey.

Mr. Dadant raises the interesting question whether the 500 colonies operated for comb honey would be able to produce 48 pounds while the 500 colonies operated for extracted honey were producing 100 pounds.

The Junior Editor (G. S. Demuth) has operated a series of apiaries for comb honey in northern Indiana for many years. During at least the past 25 years some colonies in these apiaries were operated for extracted honey, and during the past few years one of the apiaries was run for extracted honey entirely. The yields of the two types of honey in these apiaries under the same conditions, with colonies of equal strength, indicate that an average of about 75 pounds of comb honey can be produced to 100 pounds of extracted honey. During some seasons the ratio is even greater, while during other seasons it is less. Other locations would probably give different results; but, according to the figures published by Mr. Dadant, the production of comb honey under present conditions should yield a much greater profit than the production of extracted honey in locations similar to that mentioned. As pointed out by Mr. Dadant, much depends upon the locality and the season as well as upon the management.

TAKING EXTRACTED HONEY

Removing Honey in Wholesale Way After the Honey Flow. Circumventing Robbers. Extracting with Comfort

By Morley Pettit

We do not take honey off until the crop is all on the hives. This calls for a large stock of supers, and we count on an average of at the very least three ten-frame L. supers and a shallow super for each colony, spring count. That is not really enough for a maximum crop at all yards, as for example in 1916. That was the year it rained all the previous fall and all spring right up until June 25 after the clover had been in bloom for weeks. Then it suddenly turned hot, and for one month things happened! Toward the end of that month we had three supers on everything, four on a great many, and five on quite a few, all nearly full of honey and not a pound of it ready to extract, according to our standards. The weather and the honey flow were such that they could not ripen it. Where we would have been with only one or even two supers per colony I hate even to imagine. While on Government work I have visited beekeepers in cold weather and have seen their honey all in five-pound pails with a half inch of clear liquid over the granulated part in every pail. They said their honey was always that way, and thought it was a normal condition for good clover honey. They extracted frequently from one super per colony during the honey flow, turned out a great deal of unripe honey, and complained about the low price! As soon as the colony has some honey in nearly all the cells of a super another is given, always next the brood-chamber. Yes, it means a lot of lifting; but we are sure it pays. We have tried putting the empty super on top and it does not work—not in our "locality." After having made some increase and melted up some old combs we generally run short of combs toward the end of the honey flow and supers of foundation are in order. This serves the double purpose of getting combs and encouraging the ripening of the full supers above. We try to add foundation freely enough to have some partly drawn to take off; that shows they have not missed gathering for lack of space, yet it gets all well capped. Combs with wide top-bars go nine in a super, narrow ones ten.

Bee-escapes for Stripping Apiary of Its Honey.

When it comes to taking off the honey we take along escape-boards enough for one whole yard. We used to tilt the stack and slip the board under all at once, and then we tried taking one super off each hive at a time, thinking they would go out of one more quickly than from the whole stack. Now we do not do either. If enough empty combs for one super per colony in one yard can be saved from the supering season, that suits best; if not, we have to make shift until some are extracted. To put on escapes the procedure is somewhat like this: Go to the first hive and tear down the stack of supers, saving out the shallow super and any real light combs. The shallow super has been on top of the stack all summer and should be solidly filled and capped. Remove the excluder and place the shallow extracting super on the brood-chamber, then the excluder and a super containing empty combs and any unripe honey there may be in the last super which had been added to the hive. The escape goes on top of this and then the pile of supers of honey. Now the escaping bees have somewhere to go, and if the supers do not contain one cell of brood they will clear rapidly, as a rule, altho there are exceptions. This seems like work, and I do not know how to get the best results without work; but there are always two men to do it. After the escapes are all on some responsible person must go over every hive again and see that robbers have no possible chance to get into any super. They will soon be all unguarded, and if robbers ever get a start the fat is surely in the fire. With everything secure, that yard should be left to itself for a full 24 hours; if the weather is inclined to be cool, 48 hours is better.

Loading and Getting Away Without Trouble From Robbers.

In taking off supers at the end of the flow the struggle with robbers is the greatest difficulty. Where trucks are to be loaded direct from the hives this is accentuated. When it is very hot and bright we sometimes have to work rather late in the evening; but the latest plan we have tried is ordinarily sufficient to keep them within bounds. First, see that there are no very weak or queenless colonies. Then teach everyone to be as careful as possible about leaving combs exposed for bees to get a taste. Next, have a quantity of soft cotton cloths, each one large enough to cover a super, soaking in a pail containing a medium solution of crude carbolic acid. The crude kind will not burn the hands like the refined, yet it is quite as good as a repellent. Three persons can work to advantage at taking off. The supers are stacked five or six high close to the hives with an escape-board under and on top of each pile and a carbolized cloth over the top in addition. Where nine combs in a super can be crowded together and a tenth put in, this is done to prevent swinging while on the road. The taking off and filling out and stacking and covering with boards and dripping carbolized cloth, the brushing out occasional supers where the escape did not work, the taking off escapes and covering the hives, and all the while circumventing the robbers will keep three persons going well and lively. Now the truck must be conveniently placed, yet on solid ground, where there can be no possible hitch in starting, as it is hard to pile the load quite bee-tight. The driver mounts his truck, and the other two with a good wheelbarrow hand up the supers, bringing along the carbolized cloths. These are again used on the piles on the truck. Just as fast as the supers can be wheeled and carried, they are piled on and kept covered. The rack sides are slipped into place and keyed at the corners so that ropes are not necessary. It takes only a few minutes to get loaded and away. Just after starting one man riding behind removes all the cloths so the bees can fly out and go home as we drive slowly for the first mile. When we start stripping one yard we never stop until the supers are all off and away. Making the little piles down the rows, instead of piling them on the truck as they are removed from the hives, prevents forming one grand center of attraction for robbers where the truck stands. Where convenient we take two truck loads at a trip. The little Ford will not carry many, but it often saves an extra trip with the larger truck.

The Pettit Apiaries Ford ton truck with special rack for hauling supers. This rack holds 100 empty 10-frame extracting supers or 50 filled supers. Note the garage built in the honey-house. Loads of honey are taken inside away from the bees for unloading.

Cleaning Combs After Extracting.

Having arrived home the loaded trucks are both driven into the garage, which is one room in the apiary building with a door opening directly into the extracting-room. As the whole building is bee-tight, the loads are immediately under cover, and need not be taken off until morning if not convenient. After the supers of one yard are all home, or sooner if we can arrange to set two men extracting while the trucking is still going on, they are extracted to supply empties for the next yard. The next question is to get these empties placed without exciting robbing. We have them cleaned out before taking them away. That is the only practical way which I know. I have tried the various methods advocated for getting combs cleaned out after they come from the extractor, and have settled on one which I do not think can be improved on. We have over 100 colonies in the home yard. There is a large back lot with no dwelling houses near it. Just at dusk, when very few bees are flying, the supers are wheeled out into this lot and piled loosely about, with the combs carefully spaced, so that none touches another or a super side. Next morning the bees do the rest. There is not the slightest tendency to start robbing in the apiary, and it does not spread foul brood. But there are certain precautions. We never put out fewer than 100 supers at once. That satisfies all their robbing instinct, and when the combs are cleaned they are ready to call it a day and quit. We examine all our brood-chambers thoroly several times in the season, attending to the few cases of disease, and, of course, their supers never figure in an affair of this kind. I have practiced this method as long as I have been a beekeeper, and that is almost long enough for me to begin to brag about how many years it is, yet I do not know of any cases of disease in the home yards where all the cleaning is done. As a matter of fact, I fear that not much of this honey gets stored. I am sure that a great deal is wasted. On that account we run them fast and long in the extractor. If the combs get a shower while they are out, so much the better. Sometimes we turn the hose on them to thin the honey, and the bees clean them much better and with less soiling. After that they are ready for anything. They may be taken to an apiary in robbing time without causing any excitement, and that is worth a great deal. While it is still hot in August and early September we take back to the hives enough supers to prevent clustering out, and tho no surplus may be expected it is usual

Not the Three Graces, but the three helpers in the Pettit Apiaries.

to have two or three supers of combs on each hive. We have a theory that bees which sit outside the hive day after day tend to become demoralized and lose their colony instinct. A great many of these combs will have to be run thru the extractor after the final taking off, and without much reward, but we think it pays. Then there are the unexpected late runs of honey, usually of inferior quality, which would be crowded into the brood-chamber or lost without the surplus space they provide.

Conveniences for the Extracting Room.

The extracting-room has an eight-frame extractor, a capping melter heated by steam, and some long straight steam-heated uncapping knives. The honey is pumped from the extractor to the store tanks and not strained. After standing for three or more days these tanks are skimmed thoroly and are ready for filling into the selling packages which are ten-pound and five-pound pails. The capping melter is made on the principle of the Peterson, but uses steam instead of hot water. First, I made a box 11 inches deep, 18 inches wide, and four feet long, and had it lined with galvanized iron, leaving one end open as in the case of the Peterson melter. Then we took pine strips 5/16 inch thick by ⅞ inch wide and nailed them crosswise on the bottom so as to send the steam back and forth as it advances from one end of the melter to the other. On this a heavy sheet of galvanized iron was fastened and soldered at the sides to form the hot surface for melting the cappings. This leaves a space of only 5/16 inch deep for steam between the two sheets of metal, and the wood underneath helps prevent escape of heat downward where it would be wasted. The hottest steam enters the steam chamber directly under the outlet where wax and honey flow out, and the exhaust comes from the upper end and is conducted by a piece of hose into a pail of water where it condenses. Hot water from the steam which condenses in the steam chamber also flows out here. This pail of water serves the double purpose of keeping the room free from steam and providing hot water for washing hands, etc. It sits over the drain in the cement floor so a spill does no harm. Two pipes coming up, one on each side of the capping melter, take steam from the main to supply the uncapping-knives before it enters the steam chamber. Half-inch steam pipes are used thruout. Cut-off valves properly placed give complete control of the steam, so it may be thrown more or less into the melter as desired. The source of steam is a New Perfection oil water-heater with a ten-gallon boiler. Steam or hot water may be had from this at will. When steam is wanted the water inlet is closed, and when water is wanted the pressure is turned on again. Thus we can have steam all day for extracting, then turn in the water, attach a hose to the hot-water tap which stands beside the cold-water tap over the sink in the extracting-room, and wash down the floor. After that the men can go to the bathroom opening off the carpenter shop upstairs and have hot water from the same source for a good clean-up under the shower.

Uncapping and Extracting.

The steam knives, with straight handles and long enough to reach easily across the comb and still leave the hand back of the bottom-bar, I consider a very important part of the outfit. They must have sufficient head of steam to keep a jet coming from the little hole at the end during the whole time a sheet of capping is being cut off. With combs well bulged one whole side is uncapped at one stroke, and the straight handle is much easier on the wrist than the regular knife, with what I call that senseless crook so tiresome to the wrist. The top and bottom bars act as guides for the knife, and everything goes. After once or twice uncapping with a knife of this kind the combs become as even on both surfaces as so many boards. We do not care how much honey goes with the bulging cappings to the melter. It is not injured, and it keeps the wax floating freely off the hot surface. As it comes from the wax separator it is strained into the extractor, and its heat fa-

(Continued on page 425.)

The "T" yard, Pettit Apiaries. Eighty-six colonies in single colony winter cases. These are not yet unpacked for summer.

POWER EXTRACTORS

A Glance into the Inside Mechanism, Showing How Reversing is Accomplished

By E. R. Root

All reversible honey-extractors on the market make use of one of two principles for changing the sides of the combs. The first one has been used for the last 20 years, and it has given very good satisfaction; but it has its limitations. The other one, perhaps, just as old, but newer in its application, is attracting a large amount of favorable comment. In the older type the baskets or pockets are hinged on the sides, after the principle of a common door. The reversing is accomplished by swinging the pockets on their hinges from one side clear over to the other. This principle necessitates the stopping of the machine, or nearly stopping it, before the reversing can be accomplished. Even at slow speed the centrifugal force tends to throw the baskets over to the reverse side with a bang unless care is used. With new or tender combs, or combs not wired, there is more or less breakage, especially when hired help does the work.

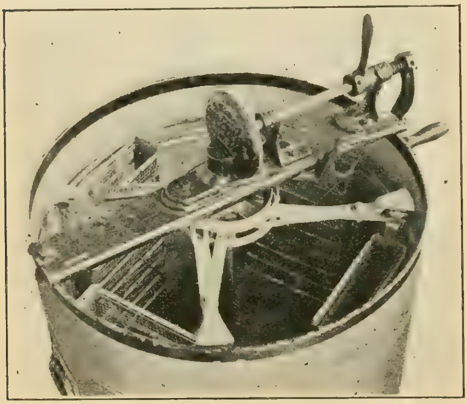


Fig. 1.—This shows the principle of reversing of the old automatic extractor. The pockets at the top and bottom are hinged on one side. The lever here shown connects each pocket with the reversing-drum, which when temporarily slowed down, and then stopped, causes the lever to shift from one position to the other. An internal sector gear is connected with each pocket on one end of the lever, and a slot and pinion on the other end. Fig. 2 shows the pockets in the act of reversing, when the pockets will be revolved clear around to the other position, subjecting the other side of the comb to the action of the centrifugal force.

The hinged-door principle of reversing requires the slowing down and stopping and reversing of the direction of the reel in order that the combs may be reversed. In modern practice it is the almost universal custom to start throwing out most of the honey on one side at a comparatively slow speed to reduce the weight of the comb. It is then reversed, when the other side is extracted clean. The first side is then returned to its first position and extracted again. This makes two reversings, and each time the machine must be slowed down, and stopped and started up again, all of which consumes valuable time right in the midst of the honey season when time is precious and help that is not afraid of bees is often hard to find. In hand-driven machines it also wastes energy.

The other principle, altho it is as old as the first, but newer so far as the general use is concerned, is rapidly coming to the front. The baskets, instead of being hinged on the side and swinging like a door, are pivoted in the center. If the reader will imagine a shaft passing thru the center of the comb pockets or baskets and thru the center of the comb lengthwise, and if he can see in his mind's eye this comb or basket revolving on this shaft like a top, he will understand the principle. Of course it is impossible to have a shaft go thru the comb; but it is possible to have the basket pivoted at the top and bottom; or, more exactly, it is impossible to have the basket revolve on an shaft running thru its center, because there can be no shaft going thru the center of the pocket without interfering with the insertion of the combs. Machines are now built

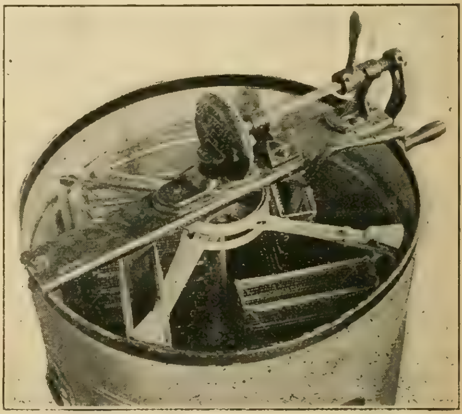


Fig. 2.—To understand this it is necessary to refer to the legend under Fig. 1. The pockets are in the act of reversing in the manner explained. The usual plan is to start the extractor up and throw out most of the honey on one side of the comb at a relatively slow speed. A pressure on the brake lever retards and stops the reversing-drum while the reel itself is run slightly faster. The result is, the lever here shown throws the pockets the other side to. When this side has been cleaned the brake lever is applied, the reel is stopped, and, while the pressure is being applied to the brake, the direction of the reel is reversed. This movement brings the pockets back to their first position, when the first side of the comb is cleaned at full speed. To accomplish reversing the next time on the next set of combs, the reel is turned in the opposite direction, when the work is performed as already explained.

embodying this idea, so that the combs can be reversed on a central axis. This makes it possible to reverse at full speed without stopping or slowing down the machine. It not only saves loss of time when time is precious, saves power, saves honey, but it also saves comb breakage. Machines built on this principle are slightly more expensive, but far more efficient, both in time and in the amount of honey secured from the combs. The new machine, being more heavily built, makes it possible to extract the combs much cleaner.

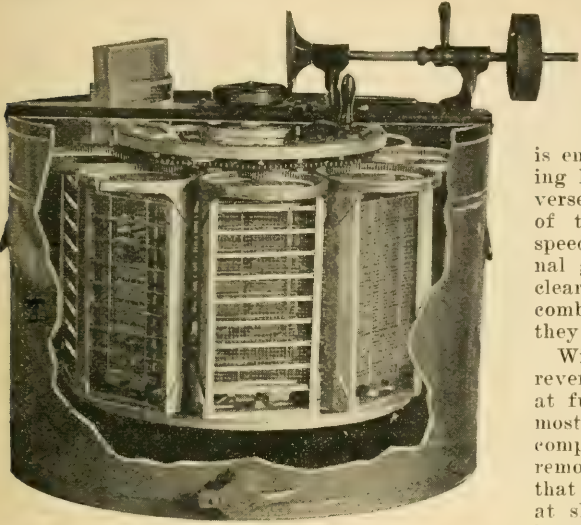


Fig. 3.—This figure, and Figs. 4 and 5, show the new Buckeye central-pivot reversing extractor that is much more efficient in time and labor, and in the saving of the breakage of combs than the other machine during the period of reversing. The reversing can be accomplished at low speed, full speed, or constantly, without stopping or slowing down the reel. As will be seen, each pocket is surmounted at the top with a ring, inside of which are teeth that mesh with a small pinion, the purpose of which is twofold—to prevent the top of the pocket from flying out by centrifugal force, and to assist in reversing. The ring and pinion at the top of the basket make it possible to insert the combs and yet allow it to reverse on a central pivot or on the imaginary axis that passes thru the center of the comb and the pockets lengthwise. Exactly in line with this axis is a pinion at the bottom, mounted on a large ring or spider which is secured to a hollow shaft loosely journaled to the main shaft to which power is applied. By turning to Figs. 4 and 5, the exact method of reversing can be seen.

One of the latest machines involving the principle of the central-pivot reversing is the one shown here. As will be seen by the illustrations, the baskets are pivoted at the bottom, and at the top they are held in position by a small gear wheel meshing inside of the ring that surmounts the top of each basket. This small gear wheel is journaled in a large rim or ring attached to the center shaft of the extractor. The pinion serves the purpose of reversing the pockets, and at the same time holds the top of them against the centrifugal force that is enormous. A pressure on the reversing lever causes all the baskets to reverse simultaneously, even tho the reel of the extractor is running at full speed. The arrangement of the internal gear or pinion leaves the pockets clear, so that it is possible to insert the combs and to remove them as soon as they are extracted.

With this machine it is possible to reverse every comb four or five times at full speed; but it is better to take most of the honey from one side at a comparatively slow speed. This will remove three-fourths of the honey on that side. The combs are then reversed at slow speed, when the machine can be speeded up to its capacity; but before it reaches full speed most of the honey is extracted from both sides of the comb. This is easier on the combs. The combs lightened of their weight can be cleaned al-

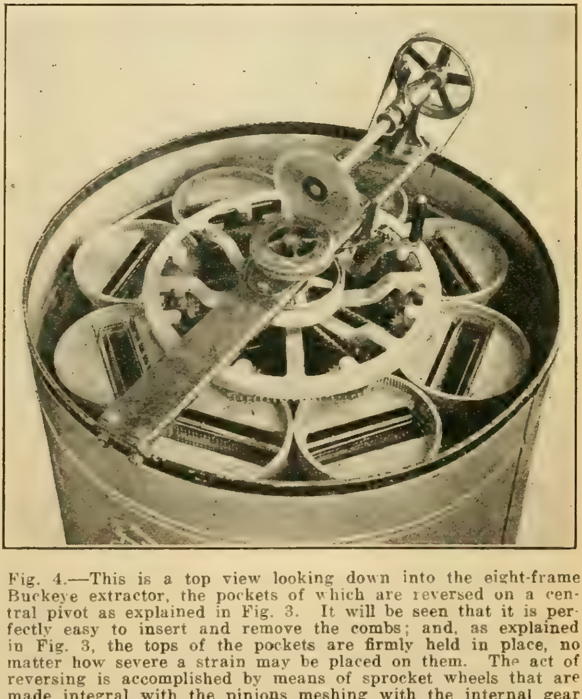


Fig. 4.—This is a top view looking down into the eight-frame Buckeye extractor, the pockets of which are reversed on a central pivot as explained in Fig. 3. It will be seen that it is perfectly easy to insert and remove the combs; and, as explained in Fig. 3, the tops of the pockets are firmly held in place, no matter how severe a strain may be placed on them. The act of reversing is accomplished by means of sprocket wheels that are made integral with the pinions meshing with the internal gear or rims at the top of each pocket. Each of these sprockets is actuated by a chain driven from a sprocket mounted on a hollow shaft loosely journaled on the main shaft from which power is received.

most dry at a high speed. There is no slowing nor stopping two times in order to reverse, as in the older styles of machines.

Where American foul brood is present in the locality the beekeeper may be compelled to melt up his old combs and rely largely on new ones built from foundation. It is these new first-year combs that are favored in the new machine, reversing on a central pivot. See what Richter says in this issue, page 433.

The wire baskets for holding the combs in this machine are removable—a feature that will be appreciated by those who like to clean or sterilize the extractor after extracting combs having a look suspicious of foul brood.

It is built very strong to stand the heavy strains that come from high speed. The difficulty of supporting the tops of the pockets of the central-pivot extractor here shown from the enormous strain of centrifugal force and yet leave it possible to insert the combs, has been solved by the use of the internal gears which also accomplish the reversing.

The time is coming when beekeepers will wake up to the fact that they are not extracting their combs clean enough. To do this as it should be done, the combs should be thoroly wired, and the extractor should be built to stand a higher speed than has ever before been thought necessary. The machine here shown was constructed with this end in view.

It is a mistake to think that all the honey from very wet combs, because the extractor could not do a cleaner job, will be saved. The dryer the combs, the more honey and the less gorging on the part of the bees. It is here that *power* extractors have an immense advantage over those driven by hand.

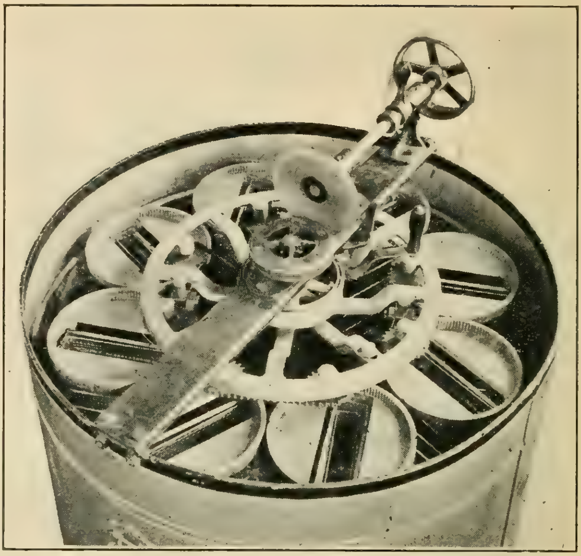


Fig. 5.—A pressure on the reversing-lever as shown by the upright handle slows down the reversing-drum very slightly. This action causes every one of the sprockets and the comb pockets to revolve half way, even tho the reel may be running at full speed. In this picture the comb-pockets are seen in the act of reversing. In the space of a second all of the eight combs will be reversed, even tho the extracting reel is revolving at full speed. The usual plan of procedure is to extract most of the honey from one side of the comb at a relatively slow speed, reverse without stopping or slowing down the extractor, clean all the honey out from the second side (still at slow speed) when the reversing-lever is pulled, thus causing the first side to come back to its first position while the honey is cleaned out at full speed. One more reversing at full speed cleans the second side. There is no loss of time in reversing, which can be done as often as desired, at full or slow speed. The reversal on a central axis is much easier on the combs, causes almost no breakage, and at the same time the work is done much more thoroly than in the machine illustrated in Figs. 1 and 2.

QUEEN INTRODUCTION

A Combination of the Push-in-the Comb Principle and the Chantry Principle

By Jay Smith

Considerable interest has been manifested in our Push-in cage. Several questions have been asked, such as, "How has it functioned since it has been in use another year?" "Is it another fad that will quietly retire into oblivion, or is it a real feature of beekeeping that will last?" I will try in the following article to give a plain statement of the success this cage has had, and also mention several new uses that can be made with it.

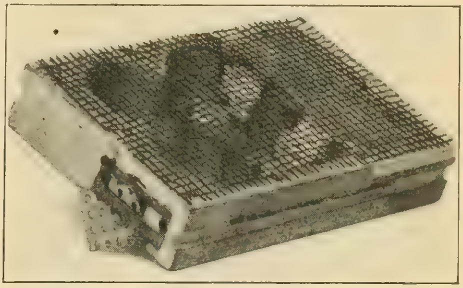
In the August number of Gleanings, 1919, this cage was described. In the same issue, the queen-excluding device was also described by Mr. Atwater and Mr. Thompson. It does not seem to be clear just who was first to use this device; but at least credit is due these gentlemen for again calling attention to it, as most of us never before heard of it, or if we had, we had forgotten about it. I will admit that when I read the article, I did not think there was much merit in the device; but, later when introducing many queens with my original Push-in cage during a robbing season, I would find that once in a very great while a queen would be killed. The Push-in cage was nearly perfect and yet not quite. What could I do to put on the finishing touch? I wondered if the Atwater-Thompson-Chantry-Costello device (that is a rather long name for such a small doofunny) would help. Then I happened to think of the principle of the newspaper method of uniting bees brought forth by Dr. Miller. Why was it so successful, and why were no bees killed when using it? Evidently it was because the bees after gnawing thru the paper came in contact with each other one at a time. That is the same principle involved in the queen-excluder. So I gave it a trial in connection with the Push-in cage and presto! it was the missing link! I put it to all sorts of severe tests, and it was successful every time. I found that to be absolutely sure in every case it was necessary to put in the cage containing the queen only, and leave it two days. Then remove the gate over the queen-excluder so that the bees can get to the queen, and leave it two days more, then remove the cage, thus turning the queen loose.

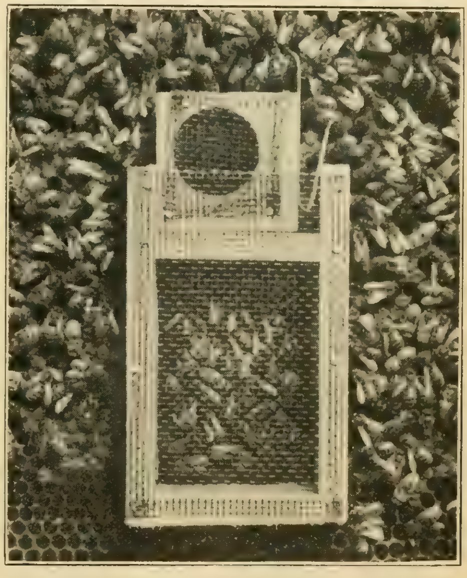
Importance of Permitting Access to the Queen Thru Perforated Metal.

We must remember this: A queen is not introduced until she has mingled with the bees. If she is in a cage and kept away from the bees, she may be in position to be accepted, but acceptance must take place after she is out of the cage, if the ordinary mailing cage is used. Now with the Push-in cage note what takes place. The queen is on the comb, has good honey to eat, and takes on the odor of the colony; but if no bees can get to her, she still has the dangerous ordeal to go thru—that of actually getting among the bees. If she suddenly gets among them, she may be frightened and start to run and the bees will grab her; but, if the bees get to her one at a time, things are different. I have watched the bees get into the cage thru the excluder many times. When the first bee gets in the cage with the queen, the bee is very much afraid of the queen and will usually turn around and try to get out. As the odor of the queen has been given to the comb enclosed by the cage, the bee feels it is getting into another hive. Then the bee will go up to the queen and hold out its tongue and offer to feed her, as if it were making a peace offering. Another bee comes in, then another. Each acts as tho it were getting into a new colony and is in no mood to offer fight. By and by more bees come in and pass out, and the word goes around that they have a queen. The queen at once speeds up on egg production, and the fact that all the cells under the cage contain one or two dozen eggs does not matter, as she keeps on, sometimes filling the cells half full of eggs.

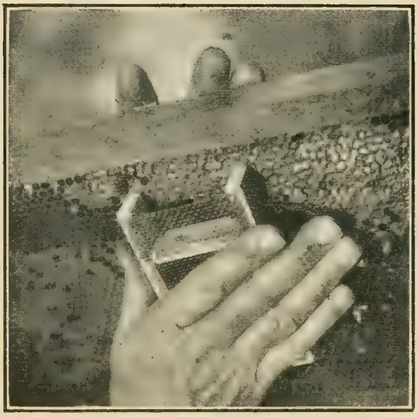
Bees Behave as if Superseding Queen.

Now I believe the secret of the success of this cage is this: It is a known fact that bees will accept an old, failing queen, when they would not a younger one. A queen that is being superseded can usually be dropped into any queenless colony and will be accepted. I believe this cage gives the bees the supersedure impulse. They know they have a queen, for they have either been in with her or have had a smell of some of the bees that have; but they seem to think that if they have a queen, she must be a poor one, as she is laying eggs in only such a small patch and laying a lot of them in each cell. Plainly they seem to reason that that queen must be superseded. I have come to this conclusion from the fact that the bees will build a piece of comb to the bottom of the cage in the space made by removing the frame to make room for the cage. On this comb they will start a large number of queen-cells, expecting the queen to lay in them. On a piece of comb only four inches long, I have frequently seen a


The Chantry principle as applied to the ordinary mailing cage. After two days the hole covered with the perforated zinc excluder is opened permitting access to the queen before she is released.


The Jay Smith cage with reception cage in place.

dozen queen-cells. Now as they believe they are superseding the queen, they will never kill her. When the cage is removed and the queen liberated, of course the queen will not lay in these cells; but, as she has reached a stage of heavy egg-production, she fills the worker combs with eggs at an astonishing rate. I have examined the colony the day after the queen was liberated and have frequently found large quantities of eggs in three combs; so it will be seen that not much time is lost for the queen, since if she had not been laying when released, as is the case when she is released from the common mailing cage, it would take her three or four days to build up to the state of egg-laying that the queen has that has just been released from the Push-in cage.



By holding one hand against the comb on the opposite side the teeth of the Push-in cage may be firmly imbedded in the midrib of the comb to prevent the bees from tunneling under and releasing the queen prematurely. It should be used on old dark combs having a tough midrib, so that the teeth will hold firmly.

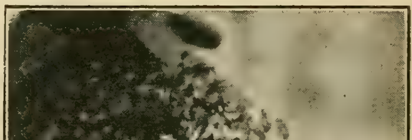
In using the queen-excluder with the common mailing cage, while it may be a help, it is far from being a complete success. In such a case the queen cannot lay, and if she is released in two days, she may be killed; and if left in four days, she will fret, as she wants to get out of the cage so that she can lay. Many queens will die in the mailing cage from this cause. In the Push-in cage, the queen seems perfectly contented and goes right on laying.

The queen-excluder is put on a little cage that we call the ''Reception Cage.'' When the queen arrives thru the mail, the small piece of perforated tin on the mailing cage is removed, and the queen and bees are allowed to run up into the reception cage. A cork is then placed in the opening of the cage, the attendant bees will crawl out thru the excluder and escape, while the queen will remain in the cage. Doolittle said that these worker bees cause much of the loss in introducing queens, so we find it better to do away with them. The mailing cage is burned, so any danger of disease is also eliminated.

Introducing Without Loss of a Single Queen

Now I am going to make the sweeping statement that I believe if this introducing cage is used according to the simple directions, that the bees will never kill a queen. What prompts me to make this statement is the fact that I have introduced hundreds of queens to colonies under all conditions, including a number to laying workers, and have never lost a single queen. A test that is as severe as introducing queens to laying workers is to introduce queens to colonies that are being robbed. In many cases the robbers were so bad that when I opened the hive to release the queen, they poured into the top of the hive in large numbers. Shortly after there would be a handful of dead bees at the entrance, but the queen was never injured. In one case the colony was overcome and all the honey robbed out. After dark I gave them a frame of honey and contracted the entrance. The queen was not injured but went merrily on with her laying, despite the fact that robbers were skirmishing around the entrance for several days. Hives may be opened as soon as the queen is released and as often afterward as desired, and the bees will never ball her, for they already consider her as their own queen.

A number of others have reported that they have done as well. A notable example is Mr. Mendleson of Ventura, Calif. He used a large number of these cages, introducing queens to many colonies, including laying-worker colonies and reports that he has not lost a single queen. Others have reported a variety of uses to which they have put this cage other than the introduc-



The Push-in cage is quite handy for caging the queen to prevent swarming. The queen-cells should all be destroyed at the time of caging the queen and again in 9 or 10 days, the queen being released a a day or two later.

tion of laying queens. What I have said above applies to laying queens.

Other Uses for the Push-in Cage.

It is entirely successful in introducing virgin queens to full colonies. While I do not advocate shipping virgin queens thru the mail, still some good beekeepers do. In such cases our cage is ideal for introducing these virgins. It has been reported to me that in caging a queen to cure European foul brood, this cage gives best results, for the queen can lay a little while in the cage, and thus the caging does not injure her, as is frequently the case with other cages. It can be successfully used in caging a queen to discourage swarming, when cutting out queen-cells. It can be used in case some fine cells have been built by a colony having a good queen during the swarming impulse. The cage can be placed over the cell and the virgin allowed to emerge in it. In introducing virgin queens to nuclei, some practice the method of placing a second virgin in the nucleus three or four days after the first one was introduced, caging the second one. As soon as the first is mated and laying, she is taken out, virgin Number 2 is released, and another introduced in a cage. Our cage is highly successful in such cases. In uniting colonies or in case an absconding colony goes in the hive with another colony and the queen is balled, she may be placed in our cage a couple of days and then safely released. If one has some laying queens which he desires to cage in a hive for any reason, the Push-in cage should be used, as a queen is not in any way injured by being kept in this cage.

Vincennes, Ind.

COMB HONEY PRODUCTION

Inducing the Bees to Finish Most of the Sections at the Close of the Honey Flow

By Geo. S. Demuth

THE close of the honey flow brings some serious problems for the comb-honey producer. If it closes abruptly, without warning, it may leave him with a lot of unfinished sections; and if it tapers off gradually toward the end, the bees often do a poor job of finishing on the last supers. Since, in most cases, it is impossible to tell just when to expect the end of the honey flow, it is important to prepare for it in advance as much as possible and hold things in readiness until it comes.

New Supers Given Only as Needed.

One of the first steps in anticipation of the closing of the season is the giving of additional super room more sparingly. After the beekeeper has been doing his utmost to induce the bees to occupy and begin work in more and more supers during the fore part of the honey flow, the tendency is to go ahead giving additional room at the same pace too long. At a certain stage in the honey flow the emphasis should change from the expansion of the surplus room to a concentration of the super work to the smallest number of supers possible and still give the bees sufficient room.

It is sometimes a good thing if the beekeeper runs out of supers during the latter part of the honey flow, for it is surprising how much can be done in the way of furnishing enough room without giving additional supers by shifting supers from one colony to another, thus giving a little more room to colonies that are beginning to be crowded and reducing the super room in those having more than they need. In fact there comes a time during the latter part of the honey flow when it is better to have the colonies crowded a little for super room, but the difficulty is to know when this time has arrived. The bees will usually stand a degree of crowding at this time which earlier in the season would have caused them to swarm or to loaf badly. Any new supers that are given at this time should usually be placed on top of those already on the hive.

Reducing to One or Two Supers Per Colony.

The second step in preparation for the close of the season is that of reducing the number of supers on each hive to one or two supers as soon as possible, concentrating the unfinished sections in these supers. Sometimes the bees are slow about sealing the honey, when it may be necessary to tier up the supers, four, five, or even six high, before any of them are ready to be taken off. At other times they seal the honey more promptly, so it is not necessary to tier up more than three supers high. Usually the bees seal honey more promptly toward the latter part of the honey flow.

As a rule it is not advisable to leave the supers on until all of the sections are finished, especially late in the honey flow, but when most of the sections are finished the super should be taken off and the unfinished sections sorted out to give back to the bees for completion. It is not safe to assume that a super is ready to be taken off by looking in at the top only. It is better to look in at the bottom also, for sometimes the sections of honey are sealed near the top and not sealed near the bottom.

Let us suppose that as the close of the season approaches a colony has five supers, four of which are nearly filled, and work has just been started in the fifth, there being enough unfinished sections scattered thru the four supers to fill one super. If these four supers are now taken off, the unfinished sections sorted out and assembled in one super which is put back on the hive, the work of finishing these sections will be carried on more rapidly, especially if the super of nearly finished sections is placed next to the brood-chamber, with the one in which but little work has been done on top. Of course these four supers would probably not all be ready to be taken off at once, but by going over all the supers every four or five days at this time, taking off and sorting those nearest completion, the supers can soon be reduced to a single nearly finished one for each colony, with an empty or nearly empty one on top to act as a safety valve if more room is needed. If there are not enough supers in which but little work has been done, to go around, an empty super should be given, providing there is still enough nectar coming in so that the bees will draw out the foundation, for the nearly finished super is usually finished more promptly if the bees are permitted to build comb in another super at the same time.

If the beekeeper has guessed well, the lower one of these two supers should be nearly finished just before the honey flow entirely ceases and the upper one should have but little unsealed honey stored in it, yet the foundation should be well drawn out and some of the combs at least partly built. This super, if taken off promptly and the bees permitted to clean out the little honey it contains, is just right for the first super next year. It is not possible always to guess so well as this, however, and while some colonies may come out just right, others will store considerable honey in the top super, while still others will not complete the lower one, so a further but final sorting of sections becomes necessary.

Selecting Colonies for Final Finishing.

During the time this last super is being finished is a good time to watch for colonies that are good finishers, as usually several colonies will be found in an apiary of sixty to eighty which do much better work at finishing than the others. These should be marked to be used in the final work of finishing.

The third step toward closing the season is that of removing all of the supers, doing this, if possible, before the honey flow entirely ceases and before the bees begin to varnish the cappings of the honey and the section boxes with propolis. The sections in the nearly finished supers should again be sorted and the unfinished ones given back to those colonies which were marked as the best finishers. This time, in assembling these unfinished sections in the supers, those nearest completion should be placed in the middle, placing sections only partly filled in the outside rows. These sections for the outside rows may be taken from those supers which were on top acting as safety valves. As these supers are now arranged, the finishing is to be done in the middle of the super where it will be done more promptly, while the comb building, if any, is done on the two outside rows.

Letting Bees Clean Out Unfinished Sections.

The supers in which but little work has been done can now be piled up crisscross near the apiary and the bees invited to help themselves, providing there are enough such supers so that the bees will not crowd each other so much that they will tear down the comb. This, of course, should not be done if the apiary is too close to a neighboring residence, and should not be attempted by anyone but an experienced beekeeper. The last supers which were given to the finishing colonies should not be left too long, but should be removed as soon as most of the sections are finished. Usually it does not pay to return the unfinished sections from this last lot of supers for completion. Some of these may be sold as culls, or cut out and sold as chunk honey. Many comb-honey producers extract the honey from these unfinished sections and save the combs for bait sections the next season.

Feeding Back Extracted Honey to Complete Unfinished Sections.

If the honey flow fails suddenly, affording no opportunity to return unfinished sections to the bees for completion, they may be completed by feeding back extracted honey. In this case, the unfinished sections may be sorted into different grades and the lightest ones extracted to secure the honey to feed back in finishing the heaviest ones.

Feeding back extracted honey to secure the completion of unfinished sections was formerly practiced to a considerable extent by comb-honey producers, but has been discontinued by most of them. Comb honey finished by feeding back is usually inferior in appearance, tends to granulate early in the winter, and much more honey must be fed than is finally stored in the sections, a large amount being consumed by the bees during the process. Successful feeding back depends so much upon selecting colonies that are in just the right condition for this work and upon weather conditions at the time the feeding is done, that few will care to attempt it, preferring to sell the unfinished honey as culls and extracting that which cannot be sold in this way.

The important thing in taking care of unfinished sections to be used again the next year is to take them off before the wood is soiled with propolis and the foundation gnawed at the edges and also varnished over with propolis.

Taking Off Comb Honey.

In taking off comb honey during a good honey flow, bee-escapes are not needed. In fact for out-apiaries it is inconvenient to use them, since an extra trip must be made to put them in place, but at the close of the season bee-escapes are almost a necessity.

When removing supers during the honey flow without bee-escapes a good operator soon learns the trick of driving the bees out quickly and taking the super away before any can return. As the cover is lifted, the bees should be started down at once with smoke and kept on the go until they leave the super. They must not be permitted to stop on the way to fill themselves with honey, for when they once get their heads into the cells, they pay but little attention to smoke.

Quite a number of bees can be brushed off the top of the sections when the hive is first opened, brushing and smoking at the same time. While the bees are being driven down, the super should be pried loose from the one below but not lifted until most of the bees are out, when one end of the super is lifted quickly, and at the same time pulled backward slightly, so it will rest upon the super below at one end, while being brought almost to a vertical position. All this should be done so quickly that the bees on the bottom of the super do not have time to get back among the sections before they can be brushed off.

If robbers are not troublesome the supers still containing a few bees may be simply leaned against the hive, standing on end, until the bees go out of them. If robbers begin to come, the supers can be piled up in the apiary, eight or ten in a pile, placing the first one on a hive cover or bottom, being careful to leave no openings where bees can enter. The top of the pile may be kept closed with a hive cover or an inner cover which is pushed off as each super is added, then quickly put back in place on the top of the pile. As these piles are uncovered from time to time in adding more, many of the confined bees escape. Finally while loading the supers to take them home, most of the remaining bees will leave them.

Sometimes the sections of honey can be sorted in the apiary without robbers bothering, and the unfinished sections returned to the bees at once, but frequently this cannot be done and it becomes necessary to haul the supers home to be sorted, unless there is a small portable honey-house at the apiary. When the supers are sorted at home, the unfinished sections can be taken to another apiary to be visited the next day.

Storing Comb Honey.

It was formerly advised that comb honey be stored in a well-ventilated room and the supers piled in such a manner that the air could circulate freely among the sections, the theory being that this arrangement would permit a further ripening of the honey after being removed from the hives. The plan is open to the serious objection that honey so exposed may absorb moisture if subjected to any great variation in temperature, for warm air which may contain considerable moisture and still be relatively dry, coming in contact with cold honey, if chilled sufficiently, will give up some of its moisture, causing condensation on the surface of the honey. Honey that is well ripened is usually safer if the supers are piled in tight piles, the piles being closed at top and bottom. Its aroma will be better also.

Plan for Next Year.

While taking off the season's crop of honey, beekeepers are inclined to neglect plans for next season. It is not too early now to begin preparing for next season by replacing all inferior queens and by seeing that enough honey is left each colony when the crop is removed, so that none of them will run short of stores during late summer and fall, as too often happens, causing the colony to begin winter in poor condition.

When two brood-chambers were used for brood-rearing in building up in the spring, these extra brood-chambers, having been taken away when the first comb-honey supers were given and tiered up on certain colonies to be filled with honey, should be given back to the colonies, thus insuring their food supply for another year. By taking off the comb-honey supers a little before the honey flow ceases entirely, and giving a second brood-chamber about two-thirds full of honey, the bees can store the honey gathered at the end of the season in these instead of in unfinished sections.

Packing Comb Honey for Market.

Scraping, grading, and casing up comb honey mean a lot of work which must be done by some one who knows how, tho the person who does it need not be a beekeeper. Every producer will have his own way for doing this work, but the speed with which it is done depends greatly upon the arrangement of the scraping tables and the system used for grading and packing.

The scraping tables need be only large enough to hold one or two supers of honey and a trough or box to catch the scrapings. An apron can be arranged with the lower edge tacked to the trough for the scrapings, the upper portion to go over the shoulders of the operator.

In scraping the propolis from the edges of the sections a section may be held in the left hand in such a manner that it can be turned as the propolis is scraped from each of its four edges on one side, then turned over, and the process repeated.

For grading it is well to have a sample section to represent each grade before the operator for quick comparison. These samples should be the lowest permitted in the grade which they represent. One good way to grade and pack is to have several shipping cases conveniently placed, each being marked for a certain grade, so that the sections of honey as they are scraped can be put directly into the shipping case for its grade without further handling.

COMPULSORY HONEY GRADING

How the Division of Markets is Helping the Beekeepers of Wisconsin

By S. B. Fracker

"YOU'VE taught me a lesson. Never again will you find me taking honey out of the combs as fast as the bees put it in."

So said the first beekeeper to be fined under the new Wisconsin honey-grading regulations which have been in force since last August. A representative of the Division of Markets had found sour and fermenting honey labeled "Wisconsin Number 1" on sale in a grocery store and soon learned that the beekeeper who supplied it was in the habit of extracting honey without waiting for it to ripen. He is probably not the first beekeeper in the United States to be prosecuted for selling unripe and sour honey, but it was the first case brought for violation of a compulsory honey-grading law anywhere in the world.

The next case was more typical of violation of grades. Stacked up in a corner of a busy city grocery store were a dozen cases of comb honey all carefully labeled "Fancy White." Inspection showed uncapped and empty cells, occasional dirty sections, discoloration, and imperfect attachment to the wood. In other words it was a typical mixture of fancy, Number 1, and Number 2 honey with a few sections which could not even be considered Number 2. Consumers were being asked to pay the highest market price, and the purchasers would go a long way to keep from buying "Wisconsin Fancy" honey in the future, if the sale continued. The marketing specialist visited the beekeeper, who in this case proved to be belligerent, and insisted that his honey was as good as any. A warning was given, but the same condition was found a week later and again a fine and costs resulted.

Compulsory Grading Protects the Beekeeping Industry.

These incidents represent different phases of the grading of agricultural products. In the first case not only the man who sold the unripe honey, but every other beekeeper who ever had occasion to sell extracted honey in that neighborhood, would have been placed under a serious disadvantage if the honey had not been discovered and returned. Purchasers, grocers, and consumers alike, after losing faith in extracted honey, probably do not try it again for many years. The injustice to the consumer and to the distributor react against the whole extracted-honey business.

In the second instance the damage to the reputation of comb honey was serious. Sections marked "Wisconsin Fancy—White" should be the finest food product from the standpoint of appearance, nutrition, and quality that the purchaser can buy, and should be as much of a delight to the eye, in the grocery store and on the table, as they are later to the palate. Any sale which brings discredit on that label constitutes an injury to honey producers which it is hard to estimate.

For several reasons compulsory grading of honey, cheese, potatoes, cabbages, and other farm products is being favorably received as a large scale marketing experiment in Wisconsin. The producers here are as hard hit as those of other States by industrial depression and deflation and by falling prices. In anticipation of this condition a division of markets was established in 1919 to assist in locating buyers, improving conditions of competition, and straightening out the channels of trade.

Sales of all kinds should be based on accurate descriptions of the material to be sold, especially where buyer and seller do not come face to face. This is the principle on which all the fruit packing of the orchard districts is based, and is the foundation on which they are developing a demand for standard qualities of fruit. One might as well expect to sell goods as first quality when that term is meaningless as to sell grain by the wagon-load instead of a legally defined bushel. In other words quality is as much a factor in price as quantity and should be as capable of exact description. Beekeepers believe honey can be accurately described and that the meaning of the terms used should be legally defined. Nobody profits by a standard price for all sorts and grades, as a low quality article not only fails to gain anything by being mixed with fancy goods but brings everything down to its own level.

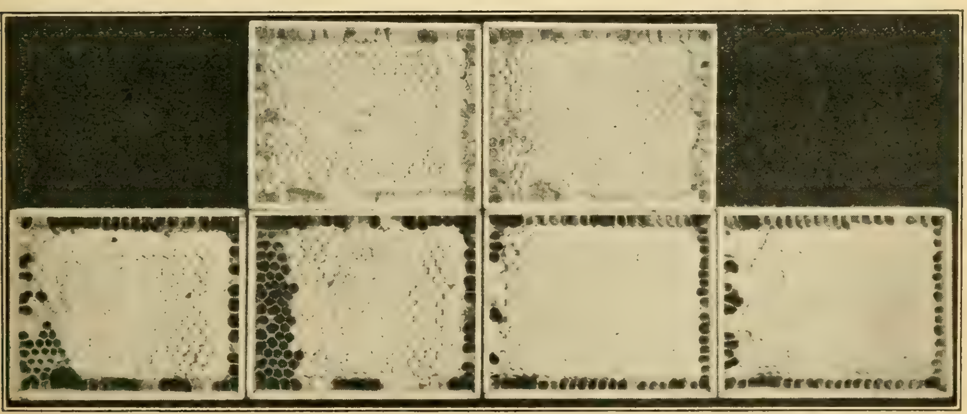
Work of the Division of Markets.

Most of the honey-grading work this season is, of course, educational. C. D. Adams, field agent of the division of markets, spends much of his time explaining the methods and standards of grading to grocers and beekeepers, with the result that the half a dozen prosecutions have been incidental rather than the most important part of the work.

It is now only a year since work was begun on the grading problem in Wisconsin and only six months since the grades went into effect. Since then every container of extracted and every section of comb honey produced in Wisconsin has had to be marked with the grade or with the word "Ungraded." No small part of the task has been to carry information about that requirement to the 10,000 beekeepers of the State. No lists of honey producers, either by the assessors, census-takers, or inspectors, are complete.

The first snag struck by the division administering the grading was what to do with the bottling industry. To supply a constant demand wholesalers were mixing honey from all parts of the United States and selling it under all sorts of brands. An arrangement was finally made with them to follow the State regulation in grading pure Wisconsin honey and to mark honey which was either blended or entirely from other sources with a statement to that effect.

Whether with justice or not, our beekeepers consider Wisconsin clover and basswood honey just a little finer than any thing else on the market. Bottlers need some of it because of the ease with which it may be prevented from granulation — especially as compared with the western product where it meets the stiffest competition. As a result Wisconsin honey is almost always held at from three to five cents above the wholesale market price for honey from other parts of the United States. Even in this year of a dull market, nearly the entire supply of extracted honey (80 per cent) had by January 1 been disposed of at an average wholesale price to the producer of 25.8 cents a pound, according to the U. S. Bureau of Crop Estimates. In other words our beekeepers think ''Wisconsin'' is just as big an asset to them as ''Airline'' is to the A. I. Root Company, and they intend to cash in on that asset if possible. If the primary purpose of the honey-grading regulations, then, is to provide for an accurate description of honey quality and finish, a second and equally important object is to advertise what we believe to be a particularly fine product.



Upper two sections "fancy." On lower row the two on the right are "No. 1," and the others "No. 2."

Standardization of Grades of Honey.

It is too soon to determine the ultimate effect of standardization on the honey business. Large quantities are, of course, being sold ''Ungraded,'' but this is a smaller proportion than was expected. Over 600 beekeepers have secured grading stamps already, including all the larger commercial producers and many farmer beekeepers.

Now and then I hear of little incidents which show how standardization is taking among consumers. In one place a grocer was called over the phone one morning and given an order which concluded:

''Oh, yes—and I want a five-pound pail of honey. Have you any on hand?''

''Certainly, ma'am,'' and it was duly sent.

Later in the day the pail came back unopened.

''What's the matter?'' asked the grocer.

''It's marked 'Ungraded,' and I want 'No. 1.' If it isn't the first quality we can't use it,'' was the answer. And nothing the grocer could say convinced this customer that if the beekeeper produced ''No. 1'' extracted honey he would neglect to label it so.

I have not touched on the details of the grades, but a word will suffice for that. All extracted honey which is well strained and fully ripened so that it weighs 12 pounds to the gallon is known as Grade No. 1 Extracted. In addition the color, net weight, and packer's registered number are required on the container. Comb honey is divided into Fancy, No. 1, and No. 2, depending on the finish, the attachment to the wood, the number of uncapped cells, etc. It is also marked with the color, and with the packer's number.

A standing committee of the State Beekeepers' Association is working with the marketing division for the perfection of the standards and the successful administration of the law. If it were practicable, many of the best beekeepers would like to see the source of honey required as part of the label, and the color omitted. But so much of the State's product is mixed, that few beekeepers know exactly where their bees are getting nectar from day to day. Nor is there an adequate chemical means of discovering whether honey really came from the plants the beekeeper says it did. The greatest variation in quality is in the amber honeys, which are sometimes excellent and occasionally very unsatisfactory.

While compulsory grading is still in a somewhat experimental stage there is no movement in opposition to the system as a whole nor any suggestion of abandoning it. When, before the state meeting, rumors of an anticipated grading debate spread, county associations began passing resolutions favoring the grades and instructing their delegates to support them. Wisconsin beekeepers believe that standardization will be the biggest help in the present rapid commercialization of the honey industry, as it has already proven a most important factor in the organization of a large co-operative company to improve honey distribution. But that is another story.

Madison, Wis.

GOVERNMENT MARKET REPORTS

How They Are Secured, and Why They Are Authentic, Dependable, and Wholly Impartial

By C. W. Kitchen

Specialist in Market News, Bureau of Markets, U. S. Department of Agriculture, Washington, D. C.

[There are some beekeepers in the country who have not understood how the government market reports are secured. One of our readers not understanding all the facts in the case complained that the government figures were incorrect for his section of country. We sent his letter on to the Bureau of Markets, suggesting that they reply, and the following is a general statement, not a specific reply, giving the history of how these reports were first started and how the information is obtained. There could be absolutely nothing more impartial and unbiased. That the reports may be incorrect at times for some localities is possibly true. The Bureau of Markets is always ready to receive helpful criticisms and any suggestions that will help the beekeepers of the country generally in getting correct information from all important centers of the country. Every honey producer and all others who have honey and wax to sell will be glad to read this.—Ed.]

DEAR MR. EDITOR:

We have your letters of June 2 and June 4, transmitting a complaint and a suggested article for publication in Gleanings in reference thereto regarding the accuracy of the honey market reports issued by this Bureau.

The person making the complaint is in direct communication with this Bureau and direct reply has been made. We do not feel that the nature of this criticism justifies public discussion of the points involved, and, therefore, the specific points mentioned may be left for settlement by direct correspondence; but it is believed that a brief description of the semi-monthly market reporting service on honey conducted by the Bureau of Markets, outlining its purposes and methods, would be timely and interesting to the readers of your journal.

The market reports on honey were started four years ago by this Bureau at the request of Dr. Phillips, the Apiculturist of the Bureau of Entomology of this Department. At that time we were organizing a nationwide market reporting service on fruits and vegetables based on the principle that those who have anything to sell need reliable information, that they should know the market conditions surrounding the sale of their products, and that of all the factors involved in the complex and intricate machinery used in the marketing of perishable products, the grower or producer is usually least informed. It was felt that the same principle applied to honey, and, therefore, instructions were issued to our various market reporters to begin the systematic and regular collection of price information on honey market conditions, which information was to be published semi-monthly. We were informed that prior to the inauguration of our service no reliable or authentic information on honey market conditions was available to the beekeeper.

The market reports on honey which now include information on beeswax are published on the 1st and 15th of each month. More than 2000 people are now receiving them direct from our office and the information is widely quoted. The information is of two classes, one including prices and conditions in producing areas, and the other comprising quotations and a statement of general conditions in the large city markets. The latter class of information is collected by representatives in charge of our branch offices in the respective cities by regular inquiry of the receivers of honey and bee products. Our representatives are salaried men who devote their entire time to the work of this Bureau and, therefore, in no way can their figures be interpreted as biased or colored to correspond with personal opinions or the advancement of personal interests. If errors occur (a reasonable percentage may be expected in any reporting service, official or unofficial), they are due to the receipt of misinformation without detection on our part or mechanical or clerical mistakes in handling it.

The quotations from the city markets represent prices paid by jobbers, wholesale confectioners, bakers, and bottlers. Reports are received from Boston, Chicago, Cleveland, Denver, Kansas City, Minneapolis, New York, Philadelphia, and St. Louis. The arrivals of honey, as well as a statement of prevailing market conditions and quotations, are shown in detail for each market. Our representatives and our correspondents are urged to limit their price figures to those representing actual sales, and when a record of actual sales cannot be given to report asking prices and designate them as such.

The information concerning prices and conditions prevailing in important producing areas is compiled by an extensive system of correspondence with a large number of producers and honey-shipping associations. By a careful comparison of quotations secured from the different sources, it is possible to maintain an accurate and dependable price-reporting service which should be of great value to producers and shippers.

Our report also includes official import and export statistics obtained from the U. S. Bureau of Foreign and Domestic Commerce, as well as reports of estimated production released by the Bureau of Crop Estimates of this Department.

Since this service was started few complaints have been received. On the other hand, the service has been frequently commended by beekeepers, individually and collectively. We believe that a wide dissemination of reliable market information has a salutary effect upon the trade not only in honey but for other products by making it more difficult for the unscrupulous receiver to yield to the temptation to render incomplete or incorrect returns and by discouraging the circulation of fictitious reports of market conditions. It is believed the publication of facts will stimulate healthy competition, discourage unfair and wasteful practices, and in so doing go far to improve the ethics of our marketing methods.

Our only purpose in this work is to publish information that is authentic, dependable, and wholly impartial. We may be justly criticised for mistakes in collecting, compiling, and interpreting the information received and will take all possible steps to correct them when discovered. On the other hand we believe we are entitled to the full and whole-hearted co-operation from the industry in placing at our disposal the complete facts regarding the market situation so that the whole industry may be benefited thereby.

During periods of market depression, such as we are now witnessing, a market reporter finds the job of collecting and compiling a comprehensive report of a large market a difficult task. In the case of New York City our reporter interviews at least 20 of the responsible receivers. Their quotations and statements are noted, and when all received a composite statement is prepared. This statement is further compared and checked in the Washington office before being released. Generally speaking no complaint can be made of the co-operation received, but a few instances have arisen whereby co-operation has been entirely withheld. You have no doubt noticed that our honey report has carried a statement for weeks from one of the most important honey markets in the United States that no information can be published concerning that market because of the refusal of the receivers to furnish the information desired.

We wish to take this opportunity to express our appreciation to you and everyone else who has co-operated in placing the service on its present basis. Constructive suggestions for its improvement are welcomed and will be accepted in so far as our facilities and methods will permit. You are at liberty to publish the contents of this letter if you see fit to do so.

Taking Extracted Honey.—Continued from p. 413.

cilitates pumping and clarifying. The steam generator is in the honey-room where its surplus heat also assists clarifying the honey, thus being beneficial instead of a nuisance as it would be if in the room where the men are working. So we have the advantage of a capping melter and steam-heated knives without the discomfort of artificial heat, or fumes from an oil stove. Store tanks are of about 2500 pounds capacity. We prefer this size to larger ones, as we never add more honey to a tank which has been partly filled and left over night. We fill one or two tanks daily according to how things go. The slowest part of the outfit is the eight-frame extractor. This year with increased extractor capacity we hope to do more in a day.

In the production of extracted honey the quality of the product is the first consideration. I do not mean necessarily color. Altogether too much stress has been placed on color, or absence of color, simply because flavor is more difficult to standardize. It is unwise to educate the public to look for water-white honey, and equally unwise to teach the difference between numerous minor sources. I have seen an old-fashioned beekeeper lead his customer around a row of cans with a spoon, saying, "Now this is fruit bloom, this is clover, this is linden, this is thistle, this is fall flowers; which would you like?" The prospect tastes one after the other and looks confused because he cannot tell much difference; or, if he can distinguish flavors, he likes one about as well as another. If he does decide that he likes one better, the chances are he is dissatisfied next time because there is no more of that particular flavor. Is it not better to strive for a uniformly good blended flavor with light color and rich well-ripened quality?

Georgetown, Ont.

FROM THE FIELD OF EXPERIENCE

TREATING AMERICAN FOUL BROOD

Advantages of Destroying Diseased Colonies at the Close of the Honey Flow

American foul brood is a disease which I am satisfied will always remain with us. The fact that we have no control over the places our bees visit, or the places wild bees house themselves, helps to confirm this belief. This being the case, it seems to me that we must find some better system of handling the disease than that now in use. The treatment now generally used has many grave faults.

While employed by the State of Ohio as an apiary inspector I found that very few were making a real success of treating disease by the shaking method. I also found that I was not 100 per cent successful when following the treatment I was advising beekeepers to use. It is true that in a large percentage of the cases I was successful, but I failed in enough cases to condemn the treatment as far as I was concerned.

When we become very familiar with American foul brood we find it is quite regular in its habits. We can depend on just what it is going to do, and about how long it will take to do it. This allows us to handle it in a way that is impossible with European foul brood. Every beekeeper of my acquaintance who has had much American foul brood to contend with and who has made a fair success in handling it, now has no fear of it. The thing that bothers him most is the extra work it makes, and the fact that the shaking treatment cuts down his crop. I probably should state that I am considering this from the extracted-honey producer's standpoint only.

Few commercial beekeepers have the time to spare during their surplus honey flow to give to the treatment of disease. This being the case, I began to consider other plans to control this disease, and after talking with many beekeepers about it I finally decided on the following treatment:

I first built a small building to be used as a honey-house for diseased colonies. In it I installed a separate extracting outfit. All combs and equipment for use on diseased colonies are stored in this building. On my spring examinations I mark all diseased colonies and usually leave them alone until the clover honey flow. About the second week of the honey flow I cage the queens in these colonies. On about the seventh day after caging queens I destroy the queen-cells. Supers are then supplied as needed until the honey flow is over when the honey is removed by means of the escape-board. The colony is then destroyed, and its hive is taken to the disease house. This is done in the evening. By caging the queen instead of killing her the colony will probably be more contented and work better. But the great value of caging instead of killing the queen is that, as long as a queen is in the colony, fertile workers will not develop.

I have saved many colonies after having run them for honey by shaking them into an empty hive after the honey flow was entirely over, leaving them in the empty hive three or four days and then supplying them with a full set of combs, a young laying queen, and plenty of food. This works well if the colony is still strong, but I consider that the bees are not worth the trouble for reasons already given.

Colonies operated by this plan give a larger average than queen-right colonies of the same strength. I presume it is because of the fact that they had no brood to feed and nearly all bees can go to the field. All colonies that develop disease after the clover flow are destroyed. Our fall flow is never good enough to treat these colonies if we desired to. And to treat them and feed enough to put them in a condition that would insure first-class colonies for the next season would cost more than they would be worth.

Disease has cost American beekeepers a large amount of money. But I feel sure that it has made us enough better beekeepers nearly to balance the account, if not more. A beekeeper that survives attacks of either American or European foul brood is pretty certain to be a better beekeeper because of his experience.

To make good my numbers I make increase during the honey flow to replace these destroyed colonies. It is rather easy for a large beekeeper to make all the increase he desires. In fact many have trouble holding their increase down. This being the case, what good reason is there for saving diseased colonies? There is no doubt but that much disease is scattered by the treatment some are giving. When our numbers are made good by making increase we can be reasonably certain that these are healthy.

Weston, Ohio. A. C. Ames.

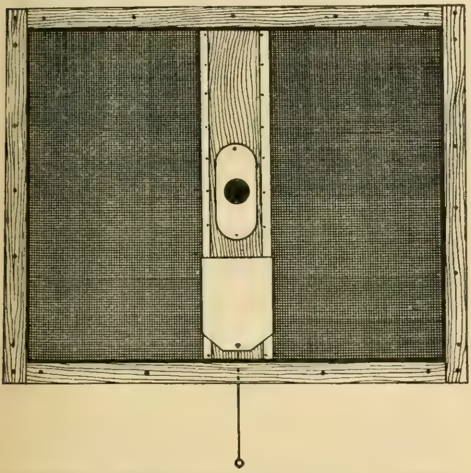
* * *

INTRODUCING VALUABLE QUEENS

A New Method for Introducing; Making Increase, and Uniting Weak Colonies

Here is something that has caught on with a number of prominent beekeepers here for the purposes outlined above. It has been well tried out for two seasons and has proved very successful here. I have used it in my own apiary with 100 per cent success, and, as there is no patent on it, I pass it on for the benefit of any beekeeper who has had difficulty in getting queens accepted.

The idea is simply a ventilated super clearer with the addition of two tin hive-rabbet strips tacked on the sides of the wooden center piece to make a runway for a tin slide that is worked with a wire thru a small hole in the side of the frame from the outside. The whole cost of the apparatus is less than the price of a good queen, and the risk of requeening is reduced to practically nothing. To requeen, first kill the old queen. Then raise two frames of emerging brood from the brood-chamber, replacing with empty combs. Put on the improved super clearer, take out the Porter bee-escape, and close the tin slide over the hole. Over this place an empty deep super and put in the two frames of emerging brood after first shaking off every adhering bee. Put a partly filled frame of honey on each side of the emerging brood, release the new queen at once on the four combs, and cover with a clean sack. The sack goes over the four frames, down the sides, and spreads over the space on either side of the screen below so as to confine the heat of the colony below the screen to the four frames above. Very little brood is lost, and the emerging bees take care of the new queen at once, so that she soon starts laying in the cells from which the young bees are emerging. In two or three days the tin slide is drawn quietly by pulling the wire from the outside and there is no disturbance to cause the balling of the queen. The bees below come up and mingle with the laying queen, which is invariably an accepted queen. A few days later the screen can be taken away, and the brood packed down below if necessary.


Ventilated escape-board arranged for introducing queens or uniting colonies.

For making increase from nuclei the same procedure is adopted except that the old queen below is left there and the tin slide is kept closed; but a small opening is made in the rear of the screen frame by making a saw-cut in the upper edge of the frame, cutting out a piece about 2 inches wide and ⅜ inch deep. This piece can be fitted with a small hinge so that it makes a small alighting-board when open. Increase can be made at little cost in this way without any sacrifice of the field force, by taking the emerging brood at the start of the honey flow when it is of least value. The heat arising thru the screen helps the nucleus to build up rapidly, and additional frames are added as it gains in strength until the hive-body is full. It is then moved off the original colony and place don a clean bottom-board and gradually turned around every day a little until the entrance faces the right way. Last year I started a nucleus in this way above a strong colony as late as September with two frames of emerging brood and eight frames of honey. Before frost there were four frames of new brood, plenty of young bees, and sufficient stores left for winter. Early this spring when I separated them I had to make more room for the queen by putting on a second brood-chamber, and now they are storing surplus rapidly. All this cost me was two frames of emerging brood, a new queen, and stores for winter. The colony below appeared to benefit also, as it came thru as powerful as any other in the yard. Of course, this winter increase was made in our mild Pacific coast climate where we get more rain than snow during the winter, and both colony and nucleus were protected in the Kootenay hive case.

The small opening from the screen frame was connected thru an inch hole bored in the side of the hive case with a 3-inch tube of birch bark rolled up like a cylinder and flattened at one end. It would hardly be possible to make winter increase in this way in a very cold climate, but it might be tried at that. W. H. Turnbull, a very successful beekeeper here, has used this plan for two seasons, and he claims he can make increase in this way any month in the year that he can obtain queens from the South and has emerging brood to give them. I have seen several of his two-frame nuclei built up into strong colonies during the winter equally as well as mine. The screen can be used for several other purposes, such as uniting weak colonies, etc. As a winter cover over the brood-frames it gives the bees access to stores by providing a space over the top-bars. It supports the packing on top and allows the moisture to pass thru. (Galvanized screen would be better for this

FROM THE FIELD OF EXPERIENCE

Stahlman's record breakers at Knox, New York (1911). No room for field bees inside the hive during the night, so they sit outside where it is cool until time to go to the fields next day.

on account of rusting.) It makes a feeding-board for a perforated can of syrup placed over the hole, and with the Porter bee-escape serves its original purpose of a super clearer. Perhaps other beekeepers may find other uses for it; but this is plenty for me, and I would not be without several of them for a great deal. A. W. Finlay.

Huntingdon, B. C., Can.

LOCATION OR MANAGEMENT

Many Good Locations Condemned as Poor Because of Faulty Management

I am sending some photos to show what has been done in my beekeeping career. Some will say that I must have a crackerjack good location, but let me stop those statements right now. I say that thousands of locations are as good or better. My beekeeping has been from New York to California, and I have also seen beekeeping outside of the United States. Many beekeepers get the idea that the grass is greener on yonder hill than at home. They should not get excited at seeing a few extra blossoms beyond the reach of their own bees. Watch your colonies, and the rest will take care of itself. Now, I don't mean to say that any place is an ideal place for bees; but I am safe in saying that 50 per cent of the number of pounds produced is

One of D. C. Stahlman's apiaries in Idaho. Record-breakers in 1920.

Some more record breakers in comb honey production. This time in Nevada (1914). Same beekeeper —same kind of crops.

up to the beekeeper, and not to the location. The photos shown are bees owned by myself and cared for by myself only. I use only standard-made hives, ten-frame, all alike, and full sheets of foundation.

I have spent thousands of dollars for my experience, but am not sorry I did so, for now I am satisfied that the grass is as green at other places as where I am located. It is up to the beekeeper.

Buhl, Idaho. D. C. Stahlman.

DEVELOPMENT OF WORKER BEES

Favorable Conditions Shorten Period of Development Nearly Two Days

It is usually said that 21 days are needed for the development of worker bees. This is a mistake, scientifically speaking, altho it is correct enough for practicable purposes.

A friend and I have made close observations of this development, and we have found out that it comes in shorter periods than commonly given. Some years ago I examined my colonies which were headed by young queens that had commenced laying eggs only 19 or 20 days before, and I saw some emerging bees. This case, of course, is not very definite.

On May 20, 1916, at 9 a. m., I hived a swarm of Italians headed by a fertile queen in a hive containing empty combs. Then on June 8 at 3:30 p. m., I examined a frame in the center of the hive, and found about 20 worker bees; so only 19 days and 6½ hours made up the entire period of development.

On April 27, 1917, at 9:30 a. m., Mr. Yoshizato inserted an empty comb into a hive of Carniolan bees. At 6:30 p. m., on the same day, just nine hours after, he counted 309 eggs in both sides of the comb, when he took it out, brushed away the bees, and gave it to a colony of Italians. By noon on May 17, 47 bees had emerged. Thus 19 days and 17½ hours elapsed from the laying of the eggs, assuming that the eggs were laid at the very time of the taking out of the frame. By 6:30 p. m., the same day (20 days after the laying of the eggs), 191 bees had emerged. In this time there were five or six Italian bees that had emerged from this same frame. By 9 a. m. of May 18, that is, 20 days and 14½ hours after the laying of the eggs, 66 more bees had emerged, thus making a total of 257. After this time he found no more Carniolan bees emerging.

In this observation it seems certain that, in the case of 74 per cent of all emerged bees, only 20 days elapsed for their development, and that in the period of 20 days and 14½ hours all the bees emerged.

On April 28 at 9 a. m., Mr. Yoshizato gave an empty frame to a colony of Carniolans. At 5 p. m. (eight hours after), there were 293 eggs in both sides of the frame. Then he gave the frame to an Italian colony. On May 18 at 10 a. m. (19 days, 17 hours after the laying of the eggs), there were 169 emerged Carniolan bees, and some Italians were emerging from this same frame. On the 19th at 8 a. m. (20 days, 15 hours after the laying of the eggs), 71 more emerged bees were counted, making a total of 240. After this time, no Carniolans emerged. In this observation 70 per cent of all emerged bees used 19 days and 17 hours, and the whole number used 20 days and 15 hours.

On May 12 at 2 p. m., Mr. Yoshizato hived a swarm in a hive containing frames of foundation. The next afternoon at 4 o'clock upon examining the hive, he found a frame with 233 eggs. On June 1 at 7 p. m. (19 days, three hours after), two bees had emerged. By June 2 at 6 p. m. (20 days and two hours after), 225 more bees had emerged. So, in the period of 20 days and two hours 97 per cent of the bees had emerged.

On May 19 at 2 p. m., Mr. Yoshizato hived a swarm in a hive which was supplied with some empty combs, and on the 20th at 8 a. m., one side of a frame had 611 eggs. By June 8 at 9 a. m. (19 days, one hour after), 36 bees had emerged. By noon of the same day (19 days, four hours after), 30 more bees emerged; by 7 p. m. of the same day (19 days, 11 hours after), 68 more. On the 9th at 8 a. m. 492 emerged bees were counted, making a total of 626. (Fifteen bees or eggs must have been overlooked by Mr. Yoshizato, unless the excess in bees is from eggs which were laid after the first counting of eggs.) All the bees emerged in the period of 20 days.

On May 21 at noon, Mr. Yoshizato gave an empty comb to an Italian colony, and on the same day at 4 p. m., he counted 135 eggs; he then gave the frame to a Carniolan colony. On June 10 at 4 p. m. (full 20 days after), 124 Italian bees were in the hive. After this time there was no emerging of Italians.

From these observations, Mr. Yoshizato asserts that the period of development of worker bees should be correctly stated as 20 days, because three-fourths emerge in this period.

The A B C & X Y Z says in regard to emerging: "This will be in about 21 days from the time the eggs were laid, or it may be 20, if the weather is very favorable." Then, I am sure, we may say, it may be 19 days, six and one-half hours, or 19 days, three hours, even 19 days, one hour, if the weather is very favorable.

Yasuo Hiratsuka.

Tara, Gifu-ken, Japan.

SIFTINGS

J. E. Crane

"Box-hive beekeepers are funny things," says Edwin J. Dahlquist, on page 368 of June Gleanings, and the queerest thing about them is that they, or many of them, don't want to be anything else.

* * *

I like Mrs. Boyden's articles very much; but, dear me! they make me discontented and restless, and wish that I too might travel to the ends of the earth.

* * *

That formula given by Prof. J. H. Diebel (page 363) for the prevention of bee stings is certainly unique, and good to hand out to our lady friends who wish to visit our home yard just to see how it looks.

* * *

We get some rather choice new phrases in the June number of Gleanings in Bee Culture. Mr. Demuth tells us of the "spirit of the hive;" Mr. Pettit of "balky colonies" and a "take-out" colony; while Mr. Greiner asks us to save the "wax diamonds."

* * *

Beekeeping can hardly be called an exact science. A large knowledge of the habits and instincts of bees, as well as their variations under different conditions, is necessary to successful management, and yet, to secure the best results, much will depend on the good judgment of the beekeeper as to the best way to treat each colony.

* * *

That method of getting bulk honey, described by Dr. Parker (page 351), seems to be new and a good way to dispose of abnormally thick combs. The product must be fine, if it does not granulate; and yet I believe, as a rule, it will be found less work to keep our bees on the line of "normalcy" than to spend our time in cutting down double-thick combs.

* * *

What is the "spirit of the hive?" This is more easily asked than answered or recognized. We must become so well acquainted with our bees by association with them that we recognize their various moods and actions as well as we do those of the people with whom we associate. We must remain novices in the business of beekeeping until we can catch the "spirit of the hive."

* * *

Mr. Demuth informs the readers of Gleanings (page 365): "The two important factors in the eradication of European foul brood are a good strain of Italian bees and strong colonies, that is, strong in the spring." These cannot be too strongly emphasized or too often repeated. But while these rules are followed or while we are trying to follow them, we may frequently find a queen whose workers fail to "clean up." Such a queen should be treated as the blacks, and replaced by another.

* * *

A. C. Gilbert (page 362) advises giving a new colony a frame or two of empty comb with frames of foundation in order to prevent bees storing pollen in sections. This is good advice; for it not only prevents the bees from storing pollen in sections but often keeps them from deserting the hive, as they will sometimes do if hived on frames of foundation only.

* * *

Jay Smith gives on page 349 as good a method of rearing choice queens as there is, and one of the simplest for introducing. If your queen-cells are of just the right age when introduced you may have in 36 hours a choice young queen in the place of an old one. If this work is done three weeks before the close of the honey flow, there will be no loss of surplus honey. Indeed, there may be more; for there will be a week or ten days in which no brood is to be fed, and a young queen will stimulate honey-gathering. It will also check any disposition to swarm if done early in the season.

* * *

G. A. Barbisch (page 368) has my sympathy for the loss of his bees by the spraying of near-by apple trees. It is one of the questions that must be worked out in some sections, or the keeping of bees must be given up. I believe a different attitude must be taken by some of our agricultural colleges on this subject. Some years ago I lost heavily from this cause. Relating my experience at a gathering of beekeepers, a professor, who had charge of the interests of beekeepers, expressed very serious doubts as to spraying ever killing bees. I have wished he might have got his notions from a yard of his own rather than from books or the laboratory.

* * *

L. L. Andrews (page 358) informs us of the poor flow of honey in southern California. Misery is said to love company; and we have at present a poor outlook for a crop of honey here in Vermont. The season has been unusually early. Very little rain fell during May; alsike clover bloomed June first while but a few inches high; white clover is blooming but little on account of drouth. If these fail we have little else to look to for surplus. It is an interesting fact that we rarely or never get a good season for honey when we have what is called an "early spring." I have never known a good season to follow such a spring.

Beekeeping as a Side Line

Grace Allen

EVERYONE who takes up beekeeping for a sideline must wish, in a certain spirit of sturdy curiosity, to learn something of bee anatomy, of the hidden intricacies of his pets, of the way the little bodies do what they do. And in the end, after having studied these things, he is led thru the cool precision of the scientific investigators to deep truths, to marvels and mysteries and a glimpse of endless processes; till the new knowledge lifts his heart, even as poetry and beauty have lifted it, to high places of reverent wonder; provided, that is, that he learn with his heart and spirit as well as with his head. For the folding down of an array of exact facts into few words is a prosy and uninspiring affair; only a warm appreciation finds the divineness within.

Even the most careless observer knows that the striped brownish little bee body is made of a head, a thorax, and an abdomen. But has the careless observer, who is often a careless thinker, too, realized that the little three-sectioned body has no skeleton on which to hang its effective muscles—but rather a hard outer cover to protect them? And has he a clear-cut realization of what inner organs and outer appendages each part bears? And that the systems concerned with digestion, nerves, circulation, and respiration run thru them all?

The Head of the Bee.

The head is triangular. On the top are three simple eyes set in a triangle and at the sides are two compound eyes, so large that they round out the face and, in drones, meet at the top of the head and force the three small eyes down on the face near where the delicate antennae are attached. Down at the lower part are the mouth, leading to the oesophagus, and the various mouth parts—mandibles that move sidewise only, and the proboscis with its strange complex parts that fold up out of the way when not needed to take up liquid food thru a central hairy tube with a tiny groove on its under side. The brain is above the oesophagus. Then there are glands, salivary glands and those other mysterious ones that go on quietly functioning in their own effective way, while microscopes and chemists and printing presses argue over their use. Do these glands secrete the food fed by the workers to the larvae (they do, declares one group) or does the larval food come from the stomach of the workers (thus, insists another group)? It's the war of the Glands against the Ventriculus, and no armistice yet, no victory for either—tho right now the gland supporters seem pressing the enemy into a hotly-contested retreat. Meantime, how well the larvae are being fed!

The Thorax.

Thru the interior of the thorax on into the abdomen the oesophagus runs its straight and narrow way; there are nerves and air-sacs and blood; and on the outside are legs and wings and the mighty muscles that propel them. In the larval stage the wings are mere thin little sacs; then the sides grow together, the blood goes back into the body and behold, the sacs become dry membranes—two pairs of them, the fore ones large, with powerful flight muscles, the hind ones small, hooked to the edge of the ones in front and moved by them. In four directions they move, up and down, forward and back. Strangely enough, the flight muscles primarily change the shape of the thorax, thus raising and lowering the wings. (Yet, in spite of being dry membranes with strange great muscles, wings are forever wings!)

As for the six legs, always when bees go walking, moving two legs on one side and one on the other, they have three legs left to stand on, a goodly number indeed. All these legs have claws at the ends, and between the claws is a sticky little pad to use when walking on smooth surfaces, on the sides of things or upside down. The legs carry wonderful sets of tools: the front legs have an apparatus to clean the antennae; the middle ones an impressive-looking spur to pry pollen off the hind leg; and the hind leg itself the pollen baskets, besides other handy appliances. Each leg also has a pollen brush. The front brushes take the pollen from the head and mouth; the second ones take it from the first and also from the thorax; the third pair take it from the second and also from the abdomen, and then they pat it and push it and pack it into the pollen baskets and bring it home.

The Abdomen.

The abdomen shows six segments plainly, even to those who are quite unaware that the head is made of several larval segments grown together, and that the thorax, not content with the three that merged to make it, has cooly annexed one abdominal segment, and that the abdomen itself has four or five invisible ones modestly tucked out of sight at the tip. The segments have movable plates over and under them; on the last four of these lower plates of the workers appear the tiny drops of wax secreted by the wax glands.

Within the abdomen are the same four great systems found in the head and thorax, the nervous system and those of digestion, circulation, and respiration. Here are also the organs of reproduction and, except in the drone, the sting.

The average beekeeper knows more about the much-discussed reproductive organs, and the sting, than about these other major systems. He usually knows that the act of mating (which causes the death of the drone) stores millions of spermatozoa in a small sac in the body of the queen, where they may live for years; that the egg, starting on its way from the small forward end of the ovary, passes on thru the oviduct to where (at the will of the queen?) it comes in contact with a generous number of spermatozoa, one of which enters and fertilizes it—or it is allowed to pass on unfertilized; that the eggs thus fertilized produce females (either workers or queens, according to the larval feeding), while those not fertilized produce drones. (Another war of the giants rages around this point—are all eggs male until fertilization, which act changes them to female, or are some male and some female, the latter requiring fertilization to develop, and the former not requiring it?)

Perhaps the inner workings of the sting are not so well known—how one poison gland secretes an acid solution and another an alkaline, both being emptied into the poison sac—or how the lancets and other parts move within the mechanism of the sheath. But beekeepers generally know (rather well) that tiny barbs prevent the bee from drawing the sting back, once it has entered the flesh, and that when she pulls herself away, torn often to the point of death, the machinery of the sting keeps right on working, going in deeper and pumping the poison in. They know, too, that it is not wise to squeeze the poison sac when removing the sting. Wherefore they scrape it off rather than pull it out.

The Nervous System.

Less familiar, yet not less wonderful, is the nervous system of the bee. It consists chiefly of a series of masses of nerve cells. This series runs lengthwise and is connected by two long parallel cords, really extensions of the nerve cells, which also send out countless fine delicate fibers into all parts of the body. These carry what may be called both incoming messages, from the sense organs, and outgoing messages from the nerve centers to every organ in the body. Each nerve mass (known as a ganglion) serves a definite territory. The brain, which is three ganglia fused together, spreads out on each side into an optic lobe which gives it direct connection with the compound eyes; it sends nerves to the antennae and to the two other head ganglia, one of which in turn sends nerves to the mouth parts. The first ganglion in the thorax sends its nerves to the first pair of legs, while the other (being four fused into one) serves the rest of the thorax, the wings and remaining legs, the abdominal segment of the thorax and even, as tho being compensatingly generous, the first segment of the abdomen itself. There the remaining segments are served by the five abdominal ganglia.

Sense Organs.

The sense organs consist of specialized nerve cells. There are many of these on the antennae, covered over with the hard outer covering, that are as yet unidentified. No one who has worked with bees will question their sensitiveness to touch, and doubtless some of these antennal organs function that way. But very little has yet been actually established as to this sense. Likewise very little is known of the senses of taste and hearing. Do bees taste? Can they hear? Who knows? No definite organs of either hearing or taste have yet been identified, tho certain sense cells of the mouth parts may well be those of taste.

It is different when it comes to smell. Beekeepers have long regarded odor as having a direct and practical bearing on bee behavior. By odor, it has been assumed. they distinguish between family and strangers. For a long time the olfactory organs were speculatively located in many different places, chiefly on the antennae, tho it has now been shown that with the antennae removed bees still react to odor. Recently both structural and experimental proof has pretty well established that 21 different groups of olfactory pores lie along the bases of the wings and on the legs and sting. In these organs the nerve cells sends a nerve fiber to the surface of the body thru a pore aperture, where the very protoplasm of the fiber, with no hard covering over it, lies open to receive impressions.

Then there are also scent-producing organs, on a membrane between the 6th and 7th upper plates of the abdomen of the workers and queens. All observing beekeepers have noticed how bees raise the abdomen when thrown in front of their hives or when being hived after swarming. This attitude is explained by the location and operation of these scent-producing organs, the odor given off being supposed to act as a guide to their companions.

Every beekeeper knows the organs of sight. But no human being knows how things look to a creature who has three simple eyes and two compound ones. The relation between these eyes in the matter of vision is not understood. The compound eye is made up of a multitude of long slender parts reaching from the outer surface to the optic lobe of the brain. Each part has a lense, a crystalline cone, and a long transparent center with sense cells around it. There is no way to change the focus of the lens. How do things look to bees?

The Digestive System.

The food of the bee enters the body by the mouth and passes on in thru the oesophagus. In the abdomen the oesophagus enlarges into the honey-stomach, in which nectar is carried. Then comes the true stomach, known as the ventriculus, separated from the honey-stomach by a gate-like valve which opens only to let the food into the stomach; otherwise it is closed to keep the nectar separate from the stomach content. (Unless, indeed, the larval food does come from the stomach instead of from the head glands, in which case this valve, the proventriculus, passes forward unopened thru the honey-stomach till it reaches the oesophagus, where it opens to permit the stomach to send back its partly digested contents.) The other end of the stomach joins the intestine, and just here about a hundred tiny tubes enter the alimentary canal. These carry into the intestine such waste materials from the worn-out tissue cells of the body as cannot pass off in gaseous form.

Probably the invert sugar of honey, the levulose and dextrose, is immediately absorbed into the blood from the stomach; the further digestive processes required by pollen and the other elements in honey take place in the intestine, where these foods are finally so changed that they can pass thru the alimentary walls into the blood to be carried to the body tissues.

Circulation.

The blood of bees, which is colorless, is not confined in blood vessels, but fills up all the space in the body between and around the organs. There are diaphragms, however, stretched along in various places, pulsing walls of membrane that hold the blood in somewhat definite channels, and by their rhythmic motions help keep it circulating. The heart is a long muscular tube lying along the upper part of the abdomen, with four chambers, and valves that let the blood in and other valves that keep it going the right way. The back end of the heart is closed, but the front opens into a long tube that carries the blood thru the thorax into the head. From the head it returns to the cavities of the thorax and on into those of the abdomen, flows around the abdominal organs, takes up the food thru the alimentary walls, and goes up into the heart again, carrying nourishment with it.

And every cell in every organ in the body chooses from the blood what food elements it needs to rebuild itself, that it may go on functioning in its own way.

Respiration.

The air needed by the bee enters the body by side openings called spiracles, two pairs on the outer walls of the thorax and eight pairs on the abdomen. It is pumped thru the body by respiratory movements which, lengthening and shortening the abdomen, open and close the spiracles. These connect directly with great air-sacs having delicate walls and a great number of branches that go all over the body. Thru these walls, of both sacs and branching tubes, the oxygen passes directly into the blood, which gives it to the body tissues.

And every cell in the body takes from the blood as much oxygen as it needs to burn up its waste materials, sends the heavier residue to the intestine thru the hundred little tubes, and gives the rest as water vapor and carbon dioxid back to the blood, where it passes thru the trachean walls into the air-sacs and tubes, and finally, thru the spiracles, out of the body into the outer air.

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In Northern California. In our central coast counties we have a considerable amount of black sage, which extends inland as far as the San Joaquin Valley. In places there is an abundance of sage right on the water's edge where fogs and cool winds are the rule almost entirely during the blooming period. Sage located thus secretes nectar, but not in as great quantities as that several miles inland. All sage in the immediate coast foothills is visited by considerable fog, especially during the morning hours, and it is this fog, more than any other factor, that lengthens the life of the plant, thus prolonging its blooming period. Apparently fog does not interfere with nectar secretion, and I was glad to learn that A. E. Lusher of Pomona had made the same statement in June Gleanings. In localities visited by fog the flow extends over a comparatively long period; but, on territory further inland where fog does not reach, the flow is of shorter duration and more intense. May and June rains, of course, prolong and greatly increase the flow of nectar. The sage flow decreases and is finally shut off during May, June, or July, according to location, owing to lack of moisture. Hot weather during these months causes this lack of moisture, and the decrease in secretion is more or less gradual. Our sage is not visited by hot desert winds, drying it out over night, as it were, and perhaps it is for this reason more than any other that sage crop failure is unheard of in this section.

Last week in one of our plants we tried out the new eight-frame Buckeye power extractor, and are more than favorably impressed with the way in which it worked. What pleased us most was that combs, filled with capped sage honey, built on foundation given the bees this spring, were lifted from the baskets with the cell walls of the combs absolutely intact. After the day's extracting there was not a particle of comb adhering to the baskets. This statement in itself means a very great deal. Furthermore, combs are extracted cleaner and in less time than with the older-model power extractors. So far we have not detected any bad features and our only criticism (this applies to all power extractors using attached pump) is that there should be a screen over the inside of the outlet of the extractor to prevent chips from frames, etc., from being forced thru the pump.

A resumption of short courses in beekeeping, conducted by the University of California and the U. S. Department of Agriculture, will take place at Berkeley during the first two weeks of December. This is good news. Later, we will give you more particulars regarding these courses of instruction, which mean more to beekeepers than anything else. If any are skeptical, they should attend the courses and then judge for themselves. M. C. Richter.

Big Sur, Calif.

* * *

In Southern California.

Weather conditions such as southern California has not experienced in the last 12 or 15 years have prevailed for a month past. The days have been cloudy and cold, with many days of light rain, making the rainfall for May the greatest of any May record. This unfavorable weather cut the orange honey to one of our lowest yields. Ten pounds per colony as an average for all colonies brought to the groves seems to be a fair estimate. The later sources of honey, such as the buckwheat and white sage, are still uncertain; but it is hoped that the late rains will help to increase the honey flow so that we will, in a small way at least, make up for the shortage from the black sage and orange. Reports from the alfalfa and mesquite sections along the Colorado River delta say that beekeepers are getting a good crop. Especially is this true in the Palo Verde or Blythe section of Riverside County.

It is lamentable to see the manner in which the enthusiasm of the newly converted beekeeper rises and wanes with the seasons. During the past few years the high prices and satisfactory crops instilled into many the idea that the road of the beekeeper was all roses and easy resting places. Enthusiasm ran high and 1000 or more colonies was the ambition of many. Some did not hesitate to buy on time or to borrow money to get into the game. This season is proving almost disastrous to some of these and discouraging to many more. Men whose ambition was thousands of colonies, now say hundreds—just enough so that they can care for them themselves and not hire help except during the extracting season. This is an ideal system and if due attention is given to the business for a term of years the returns will average with any other line of agricultural pursuits. Supposing our crop gives us a net return of $1800. This is an average of $150 per month. How many of our old associates are earning more than that? If we put this money into the savings bank and draw only the amount we need to live on, the balance will earn interest money. We can take good care of our business and have nearly half of our time for pleasure, recreation, improvement, study, or anything we like. At the same time our neighbor must put in six days a week, thruout the year, with the hopes of ten days or two weeks off during the summer. We wish that we might instill this great truth into the minds of our fellow beekeepers. It would bring peace and contentment to hundreds who are sure to feel, during this year, the pinch of readjustment, especially those who must not only meet the lower prices but also a partial or total failure of a crop.

Much more attention than ever before is being given to the question of the actual cost of the production of honey. Many reasons might be given for this, the principal one probably being the great advance that has been made in the last 12 or 15 years in the educational and social standing of the men and women engaged in the business of producing honey. We have reached that stage in the development of the industry where the operator is no longer looked upon as that old beekeeper, who is good for nothing but to care for a few bugs. Scholars, teachers, and professional men no longer consider it beneath their dignity to own and operate an apiary. When these classes enter any line of business, they soon want to know what the business returns for the time and ability put into it. The time was when 100 colonies of bees, placed in an out-of-the-way part of the farm and cared for at odd times, were considered an all-profit proposition. The honey was sold to the first buyer who came along, and no figures were kept as to the cost of production. Anything that brought cash was profitable, even tho father, mother and all of the children worked early and late seven days a week to produce it.

At least the large operators have recently published figures to show the cost of producing extracted honey. One company, operating about 4000 colonies, figures that on a basis of 60 pounds per colony, it costs ten

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cents per pound to produce it. Another figures that in operating 500 colonies and in producing a crop of less than 70 pounds per colony and selling it at 15 cents per pound, the business would be operated at a loss. While the writer does not agree with all of these figures, many of them are getting close to the actual conditions as they have existed during the past few years. Surely much good will come of these investigations, and more and more the beekeeper of today will conduct his business on a real business basis.

The best field meet of the season of the San Bernardino and Riverside beekeepers was held on June 4 at Chaffee Junior College, Ontario. Nearly 100 beekeepers from the two counties were present. The meeting was called to order by Mr. Chan, president of the San Bernardino County Club, who gave a brief address and then introduced Mr. Peterson, Farm Advisor, who gave many good reasons why the beekeepers should join the Farm Bureau. Perhaps the most important of these was the co-operative interest created in securing county, state and national legislation along the line of county ordinances, state laws and national tariff protection. The matter of co-operating with the Farm Bureau was left to a committee of three, who will investigate the benefits to be derived. This committee consists of Will Atchley of Uplands, L. O. Hattery of East Highlands, and B. H. Stanley of Rialto.

Prof. Ralph Benton was the next speaker. He talked on bee diseases, reviewing the subject from the time of Aristotle down to the present. He referred to the slogan, ''We will stamp out all bee diseases by 1925,'' and said that he wished that it might be true. After describing the several diseases, and noting the time since their discovery he summed the matter up by saying that no better methods have been found than the McEvoy method of treatment for American foul brood and the Alexander method for European. He recommended requeening for paralysis. He hopes to see better state laws and stricter enforcement of the same in the future. ''Increasing and marketing Bees,'' by Will Atchley, was very well handled, and much good information and advice were given. To make increase one should get the colonies strong for the honey flow. Then take one frame of brood and the bees from two more frames and place them directly back of the parent colony. This division should be made when the parent colony has swarm-cells, one being given to each nucleus. Add a frame of foundation or combs as required, and leave on the same location until ready to ship or until the close of the honey flow.

''Queen Rearing,'' by Henry Perkins, was one of the treats of the meeting. In answer to the question, ''How can you tell a good queen before she has hatching bees?'' Mr. Perkins said, ''I would rather judge by the cell before she emerges.'' Natural cell-building is the best condition, as three great factors are necessary for the best success, namely, plenty of young bees, plenty of food, and proper impulse. He recommends raising cells under supersedure impulse as one of the best methods. Even a small colony will raise good cells if the balance is right.

T. O. Andrews gave a good talk on the advantages of fire protection, and urged cleaning in and around the apiary location before the bees are placed thereon.

The question of the poisoning of bees from sprayed blossoms was discussed, and the matter of spraying is to be taken up with the fruit-growers to see if a satisfactory agreement cannot be attained, so that the spraying will not be done at a time when it will injure the bees. A visit to the exhibit made by the boys of the college was much enjoyed. This consisted of bees and honey, vegetables, live stock, and agricultural products in general. A visit to the college apiary, which is fitted up with all modern appliances, was the last event on this splendid program. It was agreed that Chaffee College is an ideal place for holding a field meet. L. L. Andrews.

Corona, Calif.

In Texas. The weather conditions during the month of May have been quite adverse to beekeeping. There were no violent changes in the weather; but the month, as a whole, was cold and cloudy. This was advantageous to the growth of the horsemint, but the cold, cloudy weather prohibited the bees from gathering any surplus that might have come. With the last week of the month the weather has changed for the better, and in many places quite a horsemint flow is on. If present indications hold out we may yet have a flow from mesquite.

The early spring honey crop was almost a failure. I reported last month that there was perhaps one-fourth of a huajilla honey flow, but further reports show that it is doubtful if the crop is one-tenth its normal amount. A large number of small honey flows have occurred locally from hoarhound, gaillardia, and prickley-ash; and now horsemint is giving quite a little surplus. Owing to the financial situation, it is almost impossible to make a report on the price of honey. Almost every beekeeper that has produced any honey, good or bad, is throwing it on to the market, and locally the prices have been cut to such an extent that it hardly pays for extracting. The larger

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beekeepers are holding their honey, and just as soon as these small beekeepers have marketed their crop the price will again become normal.

Dr. G. S. Fraps, of the Division of Chemistry of Experiment Station, College Station, Tex., has just issued a bulletin entitled, "The Chemical Composition of Texas Honey and Pecans." This paper gives the analysis of a large number of samples of honey from different Texas locations and flowers. Every person interested in the subject of honey and its care, should obtain one of these bulletins. This, exclusive of the government publications from the Bureau of Chemistry, is the only paper of its sort available to the public. Careful study of the tables given explains quite a number of points of interest relative to honey. Honey that granulates very quickly is very low in water content, while those that ferment have an extremely large amount of water. The locality is brought out even in chemical analysis, as the same-named honey from the eastern part of the State has a larger ash content than that over in the western part. This bulletin can be obtained from the Director of Experiment Station, College Station, Texas.

R. R. Reppert, Extension Entomologist, and Don G. Griswold, County Demonstration Agent of Denton County, made an extensive campaign for better beekeeping in that county May 5, 6, 7. The first two days were spent in visiting the beekeepers of the county, and on the last day a number of demonstrations were given, including transferring, working the hive, and properly distributing brood. At the same time, a county beekeepers association was perfected. There is no class of extension work for which there is greater demand and which give better results than the work done in beekeeping. The only trouble in Texas is that there are too few men who are in a position to do this work.

Thruout quite a considerable extent of territory south and east of San Antonio an adult bee disease has put in its appearance within the past two weeks. It has been very severe in some apiaries, and in one case the loss of 100 colonies was reported. This trouble, like all of the others of similar kind, is called by the beekeepers paralysis or disappearing disease. The trouble undoubtedly is a form of indigestion, and conditions in the field indicate that it must be caused by the bees living entirely upon the pollen and nectar from the spring-blooming flowers. The nectar from these plants produces a dark-amber heavy honey which is high in ash content. Because of the similarity in chemical composition between this nectar and that of honeydew honey, it is quite probable that there is a close relationship between this disease and the one which affects bees that are fed on aphid honey. The feeding of sugar syrup to the bees has been recommended, and where the colonies had not already been depleted a very marked improvement has been noted; but where the majority of the old bees had died the remaining were not able to save the brood, even when fed syrup.

A very peculiar and serious occurrence happened the first of this month when the S. P. Railroad sprayed its roadbed with an arsenic solution to kill weeds. This railroad runs thru the heart of the beekeeping section of Texas, and quite a number of apiaries are located very close to its right of way. In one instance one man lost almost the entire adult population of a 50-colony apiary. Just why the bees would collect the poison liquid as it lay on the railroad rails and ties, is hard to understand, but they did. One apiary, which was within 200 feet of the railroad, was almost wiped out; another one, a trifle farther away, did not lose so many bees; and those a quarter of a mile from the track were hardly affected. It was a very peculiar sight to see a hive having brood enough for 50,000 bees, containing only a queen and perhaps 200 adult bees. A rain came a few days after the poison was put on, and no trouble has been reported since.

San Antonio, Tex. H. B. Parks.

* * *

In North Carolina.—This State has not in years experienced so short a honey yield as this promises to be, especially in the eastern half of the State. Two heavy frosts about the middle of April, the second one accompanied by a freeze, literally killed the early bloom and young twigs on most of the wild honey-bearing trees and shrubs, leaving only a limited pasturage in the more protected and widely scattered places. Now the hot weather is coming on apace, and there is very little secretion of nectar on hot nights. Beekeepers are hoping for a good fall flow, but this will little more than enable the bees to lay by stores for the winter.

The central and western sections of the State did not suffer anything like as severely from the frosts as did the eastern section, due to the fact that the flora was not so far advanced as in the coastal region.

Beekeepers are taking their 1921 setback philosophically and making the best of it by striving in every way to get the bees to work to their utmost capacity and increasing colonies and building up for the 1922 season.

Bruce Anderson of Terra Ceia, Beaufort County, chosen president at the January meeting in Wilmington, has an aggressive program of activities for the North Carolina Beekeepers' Association for the current year, including particularly an exchange for the benefit of the membership. The members of this exchange may list with the secretary the honey and colonies of bees which they have for sale. Any members wishing to buy honey for their local trade or bees to increase their apiaries can also register with the secretary.

A folder setting out the system for the Exchange, as worked out by President Anderson and the executive committee, is now issued. The secretary-treasurership of the Association has just been shifted from the shoulders of J. E. Eckert to W. J. Martin, Wilmington, N. C., who has agreed to undertake the duties for the present.

There is a strong sentiment among the Association membership for a state-wide campaign to impress upon the housekeepers the great and practically indispensable value of honey as a food—one that should be on every dining table every day of the year. If this is worked out as is being recommended, the State Association will arrange for special articles and advertisements in the State press and the local beekeepers will follow up with advertisements of their special products in their local papers.

There is a movement on foot now, the executive committee having authority to act, to make the next annual session a three-day affair, with some sort of special course for the benefit of the membership; so that there will be not only the "get-together" inspirational features for the meeting, but also considerable material benefit in instruction along lines that may especially appeal to North Carolina apiarists.

State Bee Specialist C. L. Sams has been making the rounds of the different sections of the State. Wherever it is possible to arrange for them there will be demonstraions in transferring bees from the gum and box hives to the standard hives, and lectures and demonstrations in beeyards will be arranged practically everywhere he goes. In this way the much-to-be-desired passing of the old gum and box hives is being materially hastened.

It is of interest in this connection to note that the excellent picture on the front page of the March Gleanings, "Passing of the Log Gum in the South," is a photograph taken by Editor E. R. Root, at the Kelly beeyard of the Lower Cape Fear Apiaries, operated by W. J. Martin, Wilmington. It showed D. G. Kelly, whose 150 big gum hives formed the nucleus for this apiary, in which standard hives were put a year ago. Mr. Kelly has been much interested in improved methods of beekeeping, observing every feature of the advanced methods closely and "catching on" with much aptness. His hand rests on a "gum" in which he first hived a swarm when he was 14 years old. Now he is 65.

In the locality of this old Kelly apiary the many gum-hive beekeepers are coming to realize in a very marked degree the advantages of the improved hives, and a number are taking steps or laying plans to modernize their apiaries. Another season will scarcely pass without very many colonies of bees, heretofore handicapped in these old gums, finding themselves transferred into standard hives and receiving far more intelligent attention than bees in these old apiaries have ever received before. In all these improvements the "guiding star" is Bee Specialist C. L. Sams, who readily gives personal assistance to any and all beekeepers who can possibly be reached.

Wilmington, N. C. W. J. Martin.

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In Ontario.—At this date (June 10) prospects for clover honey are not so good as they were a month ago. Not that the condition of clover has changed much during the past month, but rather because bees are not generally as well off as they were early in May. Very little honey was gathered from dandelions, willows, etc., this spring here in York County, and we have had a long period with no honey coming in at all. Where colonies had an abundance of old stores they have not held up so badly, but those that were short of stores have not come along so well. All of our bees, with exception of about 200 colonies moved here lately, have required no feeding. But these 200 have been out of old stores for three weeks, and feeding has been going on all that time. While we at no time let brood suffer, yet these colonies fed every other day are not in as good condition as those that had abundance of old stores and have not been fed. The longer I keep bees, the more I am inclined to get away from feeding at all times of the year except in the fall, and then I want to do the feeding properly.

Alsike is open here in York County at least 10 days earlier than usual. But altho the ground is full of moisture and the days warm, yet the fields of alsike, pink everywhere, are yielding no nectar, and we are feeding, with acres of clover in bloom. I cannot even guess the reason, but am sorry to say that we are quite sure that no nectar is coming in. Sweet clover is just showing a few buds opening, and it is much earlier than usual, too. Only a small acreage of the latter clover was left for seed, but we are hoping it acts as it did last year.

Judging by what I have learned thru inquiries, I believe the bulk of the old honey is pretty well off the market at this writing. Dealers still quote prices of a month ago, but these prices may be named for the purpose of working off their supplies, as it is

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doubtful if they would bid for more honey at prices they are quoting regularly. However, while we expect honey will be cheaper, yet we are not worrying on that score, for unless alsike soon acts differently, there will be little white honey from that source in our locality. A letter just to hand from our Binbrook apiaries in Wentworth County, south of Hamilton, states that alsike is in full bloom there and the flow very light. There, too, they have had lots of rain; but, as here at home, something that we do not understand, is lacking for nectar secretion.

These lines are being written after a day of varied experiences, in which hard work, mixed with pleasure, made up the quota of the day's program. At 7 a. m. I drove with the car some nine miles to an apiary of 170 colonies, to see how they were off for stores, for among this lot are 100 of the colonies that we have had to feed for the past three weeks. Work was anything but pleasant as no honey was coming in, and, after examining about one-third of them in a hurry, I decided that unless honey comes in inside of two days, more feeding will have to be done, even if alsike is in bloom around the yard. When I arrived home for dinner, disgusted with conditions in so far as the bees were concerned, I made up my mind to change the program for the afternoon; so I dug some bait and again drove nine miles—this time not to a beeyard, but to a winding brook among the cedars. The mosquitoes were very much in evidence, but along with all other troubles they were soon forgotten because the speckled beauties were biting fairly well. I arrived home at 7:30 p. m. dead-tired—no question about that—but nevertheless in a different frame of mind than when I left home at noon today. This little tale is not told with any thought of its being at all helpful to readers of Gleanings, but simply once more to call attention to one of the nice things about being a beekeeper, or, for that matter, a follower of any rural pursuit. If you are working for some one else, no matter if you do get the "blues," you stay right at the old job till better or worse. On the other hand, if working at beekeeping or other kindred pursuits, one can go when he feels like it, even if work does suffer, for it is his own business, and the boss is not apt to scold when he is the one concerned. So excuse me, while I get a light to clean up those trout for breakfast, and then go to bed to sleep the sleep of the tired. J. L. Byer.

Markham, Ont.

HEADS OF GRAIN FROM DIFFERENT FIELDS

Making Increase at Close of Honey Flow. In Gleanings last August, page 485, several methods of making increase after the close of the honey flow were given. Among others was R. F. Holtermann's plan of building up nuclei into full colonies at the close of the honey flow by placing several supers of honey, bees and all, above each nucleus but separated from it by a bee-escape board. I tried the plan, but the bees wouldn't stay with the nucleus; or, at least only a very few of them did.

I then tried to build up the nuclei by another method. Just as I was taking the supers of honey from a strong colony, I removed the bee-escape board and put two queen-excluders over the strong colony, and then set a nucleus on top of the colony and separated from it by the queen-excluders. The bees couldn't go thru the two queen-excluders nearly as quickly as thru one excluder, and there was absolutely no fighting. When the nucleus was placed over the strong colony, the nucleus hive was filled up with drawn comb, as the nucleus occupied only one or two frames.

After two or three days the old colony was placed on a new stand, and the nucleus remained on the stand of the old hive. The young and emerging bees remain with the old colony, and also some of the old bees. The nucleus also received its share of young bees, as many of them would doubtless pass up thru the queen-excluders before the old hive was removed, and, of course, most of the old bees would come back to the old stand. The next day after they were separated it was not an uncommon sight to see the bees of both hives bringing in pollen, tho I didn't expect to see pollen coming into the old colony so soon after it was moved. The colonies were then fed some thin sugar syrup to keep the queens laying.

By this method a beginner can raise his own queens and introduce them to a small nucleus. Then as soon as the honey flow is over the nuclei can be built up into strong colonies. E. A. Hogarth.

Tara, Ontario.

* * *

Taking from Cellar. We have been in the bee business about 20 years. Our main honey flow comes from alsike clover. This yard is well protected on all four sides—on three sides by evergreens. We wrap our colonies as soon as taken from the cellar and keep them wrapped until the second super is full of brood.

Port Hope, Mich. Edward Stewart.

GLEANED BY ASKING

Geo. S. Demuth

Question.—If the germ of European foul brood is in the honey, like American foul brood, what good will it do to requeen colonies having this disease except to have good queens? J. G. Harman.
California.

Answer.—Requeening in the treatment of European foul brood has a double purpose: that of changing the stock to a strain that does a better job of cleaning out the dead larvae, and also providing an interval of no egg-laying between the time the old queen is killed and the young queen begins to lay. During this interval the bees have an opportunity to catch up on housecleaning. The interval necessary for this purpose depends upon the strain of bees, the strength of the colony, and the presence or absence of an early honey flow.

BEES KILLING DRONES IN MAY.

Question.—Why are strong colonies killing their drones at this season (May 27)? My colonies are extra strong and are beginning to store quite a bit of honey in the supers. Does this mean that they are not likely to swarm? C. E. Thompson.
West Virginia.

Answer.—Yes, this means that the bees are not expecting to swarm soon. They began brood-rearing so early this spring that they were in a condition to swarm a month or more before the normal time for swarming. Cooler weather and a dearth of nectar came on in the eastern part of the country at about the time the bees were in condition to swarm. During this period of cool weather brood-rearing was reduced, and many colonies began killing the drones as tho the season had closed. This occurred especially in those colonies not well supplied with stores. They will probably not prepare to swarm until several weeks after they killed their drones, if at all during this season, for it will be three or four weeks before young bees begin to emerge again in great numbers if brood-rearing has been greatly reduced. While your colonies are now strong enough to swarm most of the workers are old enough to go to the fields, leaving but few bees in the brood-chamber during the day if nectar is available. This is not favorable to swarming if ample room is given in the supers.

SWARM LOSES ITS QUEEN.

Question.—When a swarm loses its queen (she having her wings clipped) and returns to the hive, what is the proper thing to do with the colony? D. E. Scott.
Tennessee.

Answer.—Any time within five or six days or before any of the young queens emerge, all but one of the queen-cells should be destroyed, the finest-looking one being left to requeen the colony. Usually when the operator is careful to find every queen-cell, there will be no further attempt to swarm during the season when this is done. It sometimes happens, however, that the bees will swarm again soon after this one young queen emerges from her cell, this young queen going out with the swarm and leaving the colony hopelessly queenless, since at this time there are no young larvae left in the hive from which another queen could be reared. To prevent this some beekeepers prefer to destroy all of the queen-cells about five days after the swarm issued, and again five days later; then introducing a young laying queen taken from a nucleus prepared in advance for this purpose.

COMBS BUILT CROSSWISE IN BROOD-FRAMES.

Question.—When the combs are built across from one frame to another in the brood-chamber, what would you do with them? A. J. Hulse.
Indiana.

Answer.—The combs can be cut from the frame, and each one then fastened within its own frame by tying them with cord as in transferring, or they may be left as they are until next spring; then, early in May, a second story filled with old dark brood-combs should be given. If the colony is strong the queen will soon go above and begin to lay in the second story. After she does this, place a queen-excluder between the two stories to keep her from going down again; then wait three weeks for all the brood in the lower story to emerge, after which it can be removed and the crooked combs melted for wax.

EGGS IN VARIOUS POSITIONS IN CELLS.

Question.—I have a young queen that lays her eggs on the side of the cells, placing them in various positions. She is large and fine-looking. What is wrong with her? Harry R. Weiss.
Ohio.

Answer.—Sometimes when a young queen first begins to lay she does not place her eggs in regular positions; but, if she is a normal queen, she should not do this very long. You can soon tell whether she is improving or not. If her eggs produce workers, she may be all right; but, if her eggs do not hatch or if they produce drones, she should be replaced by a good queen.

TIME REQUIRED FOR RIPENING NECTAR AND SYRUP

Question.—How long does it take the bees to ripen and seal honey made from sugar, and how long from nectar? R. F. Scott.
Indiana.

Answer.—You probably do not mean honey made from sugar. When sugar syrup is fed to bees it does not become honey thru the process of ripening. Altho it may be changed slightly by the bees, it is easily detected as sugar syrup. It is not honey in the eyes of the law and could not legally be sold as such. The length of time required for ripening either nectar or syrup depends upon how thick it is at first and the amount of moisture in the air during the ripening process. In dry climates the nectar is sometimes so thick when first stored that it is ripened and sealed within a few days, while in a humid climate it may require several weeks for the bees to ripen and seal the honey if a large quantity is gathered.

DRONE-SIZE FOUNDATION FOR SECTIONS.

Question.—Has extra thin foundation imprinted with drone-cell bases ever been manufactured for use in comb-honey production?

Massachusetts. Arthur M. Southwick.

Answer.—Yes, such foundation has been made and used in comb-honey sections. The greatest objection to combs having cells of drone size in the sections is that the queen may go into the supers to lay drone eggs when there are but few drone-cells in the brood-chamber. When only full sheets of foundation of worker size are used in sections the queen seldom lays eggs in them, and a queen-excluder is not needed. Some have objected to the appearance of the cappings when drone foundation is used. The cappings and the attachment to the wood are usually more nearly perfect when worker-size foundation is used, altho some like the appearance of drone-cells better.

FERMENTATION IN COMB HONEY.

Question.—What is the cause of honey in the comb all capped over turning sour and when uncapped to ferment and run? John L. Brunson.

Utah.

Answer.—Either the honey was not properly ripened before it was sealed or it was stored where it absorbed moisture after being sealed. Honey from some sources is more inclined to sour than that from other sources. Honey stored in bait combs, especially if the combs are not cut down so that the cells are quite shallow, sometimes ferments after being sealed, bursting the cappings and oozing out on the surface of the comb. Apparently, honey that is stored in deep cells is often not ripened as thoroly as when stored in shallow cells, which are elongated as more honey is added. After being removed from the hive, comb honey should be stored in a warm dry room and not subjected to great variation in temperature since if warm moisture-laden air comes in contact with cold honey, some of the moisture will be condensed on the surface of the combs and later absorbed by the honey.

TO REQUEEN WITHOUT REMOVING OLD QUEEN.

Question.—If a queen-cell is put into an upper story over an excluder and the excluder is taken out about two days after the young queen emerges, will the young queen usually kill the old queen?

Minnesota. Joseph Lovergan.

Answer.—In some cases the old queen will be killed, but probably in most cases the virgin queen will be the one that disappears. If the colony is in a condition to supersede its old queen, the virgin queen will often be accepted. Sometimes both the old and the young queen will be permitted to remain in the colony for some time, each laying eggs in a normal manner, but usually after the close of the honey flow one of them disappears. Various schemes have been tried to requeen colonies without having to find and kill the old queen. Some have reported a high percentage of success by simply running a virgin queen less than 24 hours old into the hive at the entrance, followed by a little smoke; but this can not be depended upon for requeening, unless the bees are ready to supersede the old queen. It has been suggested that when clipping the wings of the queen her sting should be clipped at the same time, to permit her being superseded at any time by running a recently emerged virgin queen in at the entrance, the theory being that the virgin queen would be accepted because the old queen could not sting her. Apparently this plan has not worked out in practice. He who discovers a succesful method of replacing old queens by some simple plan, without the necessity of finding them, will contribute much to the industry. (See May issue, pages 266 and 275.)

FEEDING BACK EXTRACTED HONEY.

Question.—Is there a successful way to feed extracted honey to a colony or colonies, and let them rebuild it or convert it into comb honey? There is no sale for extracted honey here.

Florida. C. C. Langston.

Answer.—Extracted honey can be fed back and stored in the form of comb honey, but there are so many difficulties in the way of doing this that it would seldom be found profitable. Comb honey secured by feeding back extracted honey is usually not as good as ordinary comb honey. It sometimes granulates badly if not consumed early in the fall or winter, and is usually not so fine in appearance, the bees being inclined to build somewhat irregular comb, placing bits of wax here and there on the surface. Feeding back extracted honey to cause the bees to complete unfinished sections of comb honey at the close of the season was formerly practiced to some extent, but even this has been given up by most comb-honey producers, since unless the condition of the colonies used for this purpose is just right and the weather conditions are favorable at the time the feeding is done, much of the honey that is fed to the colonies will be consumed by the bees instead of being stored in the sections. Sometimes less than half of the honey fed is actually stored in completed sections. To feed back successfully the colonies must be strong, the brood-chamber must be filled with brood, and it must not be too large for the queen to keep well filled. The honey should be thinned down by adding about one-third of its weight of water. It should be given to the bees in a large feeder that will hold 15 to 20 pounds of honey, and arranged so the bees will take it rapidly. The feeding should be done during hot weather.

TALKS TO BEGINNERS

Geo. S. Demuth

THRUOUT a large part of the United States, July brings the close of the main honey flow. In the Northeast where alsike and white clover are the chief source of nectar, the honey flow usually closes early in July, if the weather has been hot and dry, but sometimes it continues thru the month if the weather is wet and cool. Sometimes just as the season appears to be closing, a good rain gives the clovers a new start, which prolongs the honey flow a week or more. In some parts of the clover region there are still enough basswood trees to make a difference in the amount of nectar when these trees begin to bloom, late in June or early in July. In some places there is enough sweet clover to prolong the honey flow for some time after white and alsike clover fail. There is about as much variation in the time of the closing of the honey flow as there is in its beginning, and the beginner should be alert for indications of the closing of the season, for it is important that the management of the colonies shall be in accordance with the time of the ending of the honey flow.

Sometimes the honey flow closes abruptly, without warning, taking both bees and beekeeper by surprise and leaving much unfinished work in the supers. This is often the case when basswood furnishes some nectar at the close of the clover honey flow. At other times there is a gradual tapering off in the amount of nectar brought in, so that it is difficult to tell definitely when the honey flow ceases, thus giving both bees and beekeeper an opportunity to modify their work accordingly. In this case the bees usually put less honey into the supers, as the amount of nectar diminishes, but crowd it into the brood-chamber as the brood emerges, thus greatly reducing the room for the queen.

Indications of the Closing of the Season.

Sometimes the first indications of the closing of the honey flow noticed by the beekeeper is this tendency of the bees to put more honey into the brood-chamber. Another indication is the way the workers begin to treat the drones. Usually before the the supply of nectar fails entirely, they begin to crowd the drones down on the floor of the hive or out at the entrance, and occasionally a worker may be seen struggling with a drone, apparently trying to lead him outside of the hive. In some localities another indication of the approaching close of the honey flow is the increased use of propolis about the hive in closing up cracks, and especially a tendency to varnish over the new white capping of the honey with propolis. Still another indication of the closing of the honey flow is an increasing tendency of the bees to sting.

Bees Become Cross as Season Closes.

The beginner should be very careful in handling the bees at this time. He must remember that they are most easily handled during the early part of the honey flow or during a minor honey flow still earlier, as from fruit bloom. Most beginners learn this only after a severe stinging. Even the seasoned beekeeper usually has to learn his lesson anew every year, often going ahead handling bees as tho they were always as docile as earlier in the season, until the bees teach him by many stings that it is now time to be more cautious.

If the honey flow ceases suddenly, the beginner who has enjoyed taking a peep into his hives every few days to see what the bees have been doing, will be surprised when he takes his first peep at the close of the season, to find that the docile creatures of a few days ago have suddenly learned to fight with a vengeance. There are times when it is advisable to leave the bees strictly alone, unless some attention is really necessary.

Management of Supers Toward Close of Season.

As the close of the season approaches, additional supers should not be given as freely as earlier, especially for comb honey, and if the honey flow is slowing down, the empty super should be placed on top of those already on the hive instead of being placed under them as before. (See pages 346 and 347, June issue.) At this time it is well to wait until the bees have nearly filled the last super given before giving another, but they should not be crowded for want of super room even now, and the new super should be given before the combs in the last one are completely built out.

All comb honey supers that are nearly finished at this time should be taken off, the unfinished sections sorted out, and put back on the hives to be finished. In doing this it is well to put the sections that are most nearly finished in the middle of the super, so they will be finished promptly when returned to the bees. This should be done, if possible, before the close of the honey flow. In this way it is usually possible to reduce the number of supers on each hive to a single one, thus concentrating the work in the supers and greatly increasing the chances of having the sections finished.

For chunk honey (comb honey produced in shallow extracting frames instead of in sections) the same rule should be followed, but for extracted honey it is not necessary to take off any of it until some time after the close of the honey flow, thus permitting it to ripen thoroughly before extracting, altho any of the combs that are sealed or nearly so, may be taken out of the super and extracted at any time. This is sometimes quite desirable if there are not enough supers to hold the entire crop, for these combs of honey can be extracted and the empty combs returned to be refilled.

What To Do With Late Swarms.

There will probably be some late swarming this season in the North. Swarms that issue near the close of the honey flow are quite a nuisance and it is sometimes rather puzzling as to what is best to do with them, for if they come too late they may not gather enough stores for their own use during late summer and fall, to say nothing of their winter stores. Swarms that issue in July may be managed as described in the May issue of Gleanings, providing the honey flow is good and may be expected to continue for two or three weeks, but if swarms issue too near the close of the honey flow, it will be better not to permit a division of the original colony at this time.

A late swarm may be hived back into its own hive without the queen, then all but one of the queen-cells destroyed six days later, the one queen-cell (the finest-looking one) being left to requeen the colony. If the queen's wings are clipped she may simply be caught and killed while the swarm is out, or if a queen-trap is used, the trap may be removed (first being sure that queen is in it) and the queen disposed of at any convenient time. When the queen accompanies the swarm (not having her wings clipped and no queen-trap being used) the swarm after clustering may be shaken into a basket, carried to the hive, poured out in front of the entrance and induced to re-enter the hive, but first covering the entrance with an entrance guard or a queen-trap to keep the queen from going in with the bees. When most of the bees have gone into the hive thru the queen-excluding metal, those remaining can then be driven in by smoke, so the queen can be found and killed.

Sometimes when a swarm issues just as the season is closing, it works well to hive it in a box, placing the box close beside the hive, then after a day or two shaking the swarm out of the box and hiving the bees back into their own hive. If it is quite late in the season, the bees will sometimes destroy their own queen-cells when this is done and give up further swarming.

Beware of Robber Bees.

After the honey flow, every precaution should be taken to prevent robbing. At this time, if a hive is opened and the combs exposed for even a couple of minutes, bees from neighboring colonies may have time to get a taste of stolen sweets, after which they may come in great numbers for more. If these robbers are able to enter the hive before the colony being handled has had time to reorganize for defense, they may come by the thousands to carry away loads of honey. The colony being robbed may be so completely overcome by the robbers that it fails to organize for defense, and is soon practically ruined by the attacking robbers. After such a start at robbing, the robbers may attack other colonies in the vicinity, and any that are too weak to defend themselves will be robbed of all their honey in the same way.

Not only are colonies ruined in this way, but when bees begin to rob they become exceedingly cross and attack any living thing within several rods of the apiary. The city or village beekeeper, when taking honey away from the bees at the close of the season must be exceedingly careful not to expose any honey where robbers can get at it, for there is great danger of starting the bees on a rampage of robbing and stinging, causing great annoyance to the neighbors. All such troubles can be avoided by a little care, but unfortunately many beginners must pass thru at least one such ordeal before they fully realize the seriousness of exposing a little honey after the close of the honey flow, and the necessity of preventing even the slightest beginning of robbing.

How to Detect Robbers.

Robbers are inclined to collect around the edges of the hive cover or between the brood-chamber and the super, if the propolis which sealed these cracks is broken by opening the hive. Bees do not do this except when trying to rob, so this is always a danger signal. When they begin to do this it is time for the beginner to quit working with the bees, tho the veteran may be able to continue his work by extreme caution.

When robbers succeed in passing the guards at the entrance, the beginner can detect this by the great commotion at the entrance. Robber bees do not usually alight at the entrance and go directly into the hive, but dart about before alighting, watching for a chance to slip by the guards. They may alight at the entrance in a nervous manner and again take wing, doing this repeatedly before actually entering the hive.

If the colony being robbed fails in its defense, the robbers enter more boldly and may be seen coming out with loads of stolen honey. In doing this they usually run upward on the front of the hive before taking wing, instead of flying direct from the entrance. The commotion of robbing can be distinguished from the playflight of young bees by the appearance of the bees, the robbers being older, by the higher pitch of their humming, and by their nervous manner in flight. Robbing may occur at any time of day, while young bees usually take their playflight early in the afternoon.

Taking Off Honey at Close of Season.

As soon as the honey flow ceases, all comb-honey supers should be taken off the hives, regardless of whether they are finished or not, for if left on longer, the bees will ruin the sections by covering them with propolis

(Continued on page 452.)

OUR HOMES

A. I. ROOT

A little child shall lead them.—Isa. 12:6.
Butter and honey shall he eat.—Isa. 7:15.
I will bring you into a land flowing with milk and honey.—Ex. 3:17.

On Memorial Day we had a reunion of the Root family. In fact, we have frequent reunions when we can get the whole tribe together. We usually have it out in the woods or in some shady retreat, especially if the weather is hot. Perhaps I might mention that, besides our own five children, there were present our three sons-in-law and two daughters-in law, and ten grandchildren and four great-grandchildren. At these reunions everybody carries some sort of lunch to put on the table, and everybody can look it over and either go and get, or call, for the particular kind of food he prefers.

They assigned a place to me on a little bit of lounge by the side of the mother of three of the great-grandchildren—Mrs. Ethel Calvert. By the way, the first meeting with this good lady was when she herself was a comparatively little chick. Her father and mother (Mr. and Mrs. Acklin) had charge of our branch house at St. Paul, Minn. I mentioned this in a write-up years ago, and told how I was impressed and delighted with the wonderful singing of this young miss; and altho she is now the mother of three beautiful little girls, she looks much like a "young miss" even yet. So much for the mother. Between us was one of the little girls, two and a half years old; and as she could not hold her own special cup of milk very well while sitting on the lounge, they brought her little baby-chair, and finally a minature table to match the chair. See the picture.

This banquet was about an hour and a half later than my regular suppertime. The reason for being so late was because we could not call in all the wanderers, big and little. On this account I was getting to be somewhat faint, and all because of the delayed mealtime. In order to serve the children first, when they got the chair and table fixed her mother gave her a big glass of milk. I said to myself mentally, "Why, that little chick can never drink all of that milk." But she grabbed for it, and then proceeded to sip very slowly. When she had finished half the glass and pushed it back to the middle of the table I supposed, of course, she had all she wanted; and as I had then for some time been "hankering" for some of the same milk I suggested to the mother that the child would not want any more, and that I might have what was remaining in the glass. Instead of acquiescing, however, she called for a fresh glass for myself, and still later she pointed to an empty glass on the little table, and called my attention to the fact that the little girl drank it all. I expressed surprise that she could drink so much at one meal. But later on, when the repast was about all over, the father of the little girl called my attention to a second glass of milk for that one wee little girl; and when I asked if it would not make her sick, he gravely informed me that she not only drank about that quantity of milk three times a day, but sometimes she had a *third* glass and yet did not become sick. In fact, her mother informed me she might almost say that the little girl had never been sick a day in her life.

My friends, I have taken quite a little space to tell this story, for there is a big moral to it. The great wide world has not discovered *even yet* the value of milk, not only for babies and growing children, but for middle-aged men and especially for old

Roberta Maude Calvert, 2½ years old, never sick a day in her life, sipping her regular ration, of a pint of milk, three times a day.

men like myself. Since prohibition has gone into effect we are told that milk is largely taking the place of beer. I have frequently noticed, and mentally thanked God to see men in the cities, doing hard muscular work, rush into a grocery, perhaps where they used to get beer, and get a bottle of milk. Just think of the difference! The brewers used to try to make us believe that beer was liquid bread. But I think that pretty much everybody knows just now that there is no bread about it. It is not food at all. Some years ago I started to get up one morning; but as soon as I straightened up on my feet I felt so dizzy that I had to lie down again. I tried several times, but it was no use. Mrs. Root had been up some time, and had made some hot coffee. I suggested that a drink would perhaps do me good. Somehow I tried it without milk. It did not help me a particle. As she usually drinks tea I suggested that perhaps the tea would help. Like the coffee, it did not do a mite of good. Then I thought of milk, and took perhaps a teacupful, sipping it slowly. The milk hit the spot, straight and sure. What I needed was nourishment. Tea and coffee were not nourishment at all—simply stimulants that did harm rather than good. When the whole wide world can be fully educated and enlightened to the advantages of milk over stimulants of any sort we shall be well on the way toward the glad time when the new heavens and the new earth will be ushered in.

Now, there are going to be two parts to this Home paper. The above is part one. Part two is something I saw in the Cleveland Plain Dealer a few days ago. The story is rather too long to copy, and so I will give my own version. A soldier had long been in the hospital, and I think that he and his friends had for some time despaired of his ever getting up. He was suddenly taken worse, and a particular friend of his—an army official—was notified that his friend would probably not live more than 15 minutes, and that if he wanted to see him before he died he would have to drop everything and hurry up. This titled friend of his of course dropped everything and rushed to the bedside. The poor fellow thought his time was near; and when asked if there was anything he wanted, what do you think he said? He replied that he wanted some buttermilk.

"Why, haven't you been having buttermilk when you wanted it?"

"No. The doctor and the nurse both declared that in my condition it would be very dangerous."

"In *your* condition! Why, bless your soul, if a man is going to die in 15 minutes what difference does it make what he has?"

Then he continued:

"I will get you some buttermilk just as soon as possible, and I want you to take notice that you *must* live until I get it."

The waiter who was sent for it came back, saying there was none to be had anywhere in the neighborhood. But this man of authority replied with vehemence:

"This poor sick soldier is going to have some buttermilk, no matter what it costs. How far do you have to go for it?"

They said there was none to be had nearer than 22 miles.

"Well, you all get busy. Hunt up the fastest automobile there is in the camp, and go over and get that buttermilk and hustle back. It is a matter of life and death."

In due time the buttermilk came. It was more than 15 minutes, but the patient was not dead. I think the great energy of his long-time friend, the general whom he had been in the habit of obeying, had much to do with keeping him up. He stayed right by the patient. He gave him a little sip at first. A few minutes later he gave a little more. When that baby drank a big glass of milk it made me think of the poor soldier. Did the buttermilk kill him as the doctor and nurse said it would? Bless your heart, no. It was the very nourishment that old Dame Nature had been calling for. By the way, this story I am telling you is rather tough on our doctors and nurses, and our hospitals as well. I wonder if that could have been a place where these "old relics" still exist, that give rum and whisky to a sick or dying man. The buttermilk acted on this poor run-down soldier exactly as the milk acted in my case. During the next 24 hours the patient drank half a gallon—of course at intervals. He is now alive and well. Instead of dying in 15 minutes, he did not die at all.

"Butter and honey shall he eat, that he may know to refuse the evil and choose the good." I am told that in the Bible the word butter is only another word for clabbered or butter milk.

I shall be glad if this Home paper shall stir up the people to a better knowledge of the fact that milk, including its different forms, such as buttermilk, cheese, etc., is oftentimes better medicine than anything the drugstores or the doctors can furnish. If you declare, as I have many times done, that milk does not agree with you, follow the example of the little girl and sip it slowly. Take half a tumblerful or two glasses as she did; and I think the example in the way of diet, and other things that these little ones set before us, will be, many times nearer right, and a safer guide than some of the great writers and teachers in the matter of health.

THE HUBAM CLOVER.

"Tall Oaks from Little Acorns Grow."

Some of our readers will doubtless recall the fact that in Gleanings for July 1, 1915, pages 536 and 537, I gave two pictures of a new sweet clover. It was a large plant and had much larger leaves than any sweet clover I had ever seen. I sent specimens of it to our experiment station, and Professor Thorne pronounced it a "mutation," and he said he was very glad I had got hold of it, and that it might prove to be something of great value. Later on I offered a few seeds from this plant to any of our subscribers who might care to work with me in giving an improved sweet clover to the world. Well, so far as I can learn, not much came of it, and we rather decided that the extra amount of bloom and larger leaf were owing to some favorable conditions rather than to the fact of its being a different variety. My article on the matter, however, called forth letters from far and wide in regard to sweet clover plants that showed unusual peculiarities.

As early as December, 1916, we printed a reference to an annual white sweet clover. On page 1189 of that issue, we find the following:

> A field of *Melilotus alba* sown here last spring bloomed profusely when about four feet high. I enclose a sample, and ask the cause if you know of any parallel case. I have never know it to bloom the first year. C. W. Riggs.
>
> Earl, Ark., Sept. 26, 1916.

On page 385 of the May issue, 1917, under the subject, "White Sweet Clover in Full Bloom the First Year's Sowing," we printed a letter from W. O. Graeber, Milbrae, California, a part of which runs as follows:

> In the December 15 issue, on page 1188, I noticed an article by Mr. C. W. Riggs, regarding *Melilotus alba* blooming the first year. I have only one year's experience with it, and that was in 1915, when in April I sowed a small patch just to see how it would do in my locality. I kept it moist with a garden hose, as there was no rain for a time. It came up nicely and grew rapidly; and when about four feet high about the first week in July, it began to bloom and kept growing higher and sending out new buds and blooms. I went away August 4, and a few days before going I took an eight-foot rule and measured a number of the stalks. The tallest measured 9 feet 8 inches, and it was still growing when I left. Several other stalks went 8 feet and 7 feet 6 inches, and from that down to 3 feet. Some of the stems were almost a half an inch in diameter at the base. When I returned the latter part of September it had seeded and most of it was down. My bees were very busy on it while it bloomed. I got the seed from a local seed house, and it was the white variety, very sweet-scented.

These were among the first, if not indeed the first, references that ever appeared in any periodical in reference to an annual sweet clover.

Now, our journal goes to the Agricultural College, Ames, Iowa; but I do not know whether Prof. Hughes at that time was conversant with Gleanings or not. I think very likely he knew something of my efforts to get a superior strain of sweet clover, and that I had also been sending packets of seed to any one who would send a stamped envelope. But I rather think he knew something about it, because of a little packet of perhaps 50 seeds he sent me with the following letter:

> Mr. A. I. Root:
>
> We are sending you $40.00 worth of seed—not by freight, but inclosed herewith attached to an explanatory sheet and with our compliments. You will be interested in the attached statements regarding this seed, which I am sending to the different State experiment stations. Will you plant this seed this year? Farm Crops Section,
>
> By H. D. Hughes.
>
> Ames, Iowa, April 15, 1918.

I straightway sent half of the seeds to our own experiment station. However, he had already sent some there direct. My own 25 or 30 seeds were carefully planted indoors, and in October, 1918, I notified the friends that I was ready to send a small packet to any applicant. We did not keep record of how many were sent out; but we had so many letters, all favorable, that there was not room for more than a small part of them in Gleanings.

There was a picture of the plant given on page 374 of our June issue. You will notice what a tremendous amount of feed it is going to make, aside from the honey. While I write, June 14, it is not settled positively that the plants that live over will still produce the real Annual seed, or whether it will revert to the old biennial, or whether there is a bare possibility of finding a perennial. The plant we picture in this issue is budded ready to bloom. There is no question about its being the Hubam that wintered over, because the old dried stalk was still in the center when I found them starting this spring.

The plant pictured on page 374 June issue, 32 days later; yard stick on right.

A valuable Government bulletin (Annual White Sweet Clover) was issued by the Department of Agriculture last April. This bulletin contains 21 pages, with illustrations on nearly every page. It may be secured of the Government Printing-office for 5 cents per copy. It covers the whole ground completely, except that no mention is made in regard to the plants that winter over, such as I have pictured. Prof. Hughes' joke about sending me fifty seeds, "forty dollars worth," was something more than a joke. I think I have already mentioned that the DeGraff Food Company, DeGraff, Ohio, paid our good friends, The Field Seed Company, of Shenandoah, Iowa, something like $10,000 for half of the seed from a six-acre crop. Well, Mr. Crites, president of the above company, has just paid us a visit. (See their advertisement in this issue.) Near their plant at DeGraff, Ohio, they are putting out 500 acres to this new sweet clover. They have also 100 acres somewhere in Texas, where they are now harvesting the new seed. Besides this, they have about 500 more—I think in North Dakota.

By the way, we have several reports from our subscribers who have had a little packet of perhaps 30 to 40 seeds of getting from one to two pounds of seed from these little packets we have been sending out. Prof. Hughes informs us that the College, Ames, Iowa, has been kind enough to grant him a leave of absence for one year to visit Alabama, where the seed was first found, and do what he can for the benefit of humanity, in addition to what he has already done in working out the possibilities of this plant, and in helping to develop it as rapidly as possible.

A 9-foot plant of Hubam clover at Ames, Iowa, 1920. H. D. Hughes tries to reach the top. Photographed in October when the seed was ripe and most of the leaves had fallen. This clover has made a growth of 9 feet in 3½ months. When the Iowa Station first announced the discovery of this clover in 1918 it was with the statement that it had grown 4½ feet in 3½ months, when medium red clover made a growth of 5 inches. Growths reported in 1920 are 100% greater than those first reported.

Let me digress a little. In our recent Sunday-school lesson we had the story of the good Samaritan. Now, as I see it, Prof. Hughes is a good Samaritan to the whole wide world. His active energy in getting the seed quickly disseminated, not only thruout America but the whole wide world (even into the islands of the sea), is certainly commendable; and I feel particularly happy to think that it was my privilege, altho I did not at the time realize what I was doing, to back him up and help him in his efforts to reduce, say, the "high cost of living." I verily believe this plant will do more to make this "a land flowing with milk and honey" than any other plant, possibly, in the whole world.

By the way, The DeGraff Seed Company, DeGraff, Ohio, have sent us some leaflets giving full information in regard to this new clover. They have also sent us several pounds of the seed which they have gathered in Texas from seed that was planted since last Christmas. This is very nice-looking seed and we have planted some of it near our office and have some left. We are still going to send out trial packages of this wonderful clover, and if The DeGraff Food Company will keep us supplied with seed (which I know they will until we produce some ourselves this fall) we will keep on sending seed in small pinches to every one who asks for it. I want every bee man who has not seen this clover grow to write me for a pinch of the seed and for one of these leaflets which The DeGraff Food Company have sent us. I want to help Prof. Hughes and The DeGraff Food Company and every one else in distributing seed of one of the greatest plants which God in His all-wise Providence has given to his children.

ADDITIONAL INFORMATION.

We have just received from Prof. Beckman of the Iowa State College a communication from which we make clippings as below:

> When seeded with small grain at Ames, Iowa, it produced six times the growth of medium red and mammoth clover, and three times that of the biennial white sweet clover, following the removal of small grain crop. When seeded broadcast on a weedy and poorly prepared seedbed the last of May it overcame the weeds, made a growth of 5½ to 7 feet and matured a seed crop.
>
> The growth when carefully measured has often averaged over 1½ inches per day, with a maximum under greenhouse conditions of 2½ inches in 15 hours.
>
> Its heavy seed-setting characters are indicated by seed spikes which have measured 20 inches in length. Planted in rows three feet apart the seed yields have averaged from 5 to 8 bushels per acre, while with closely spaced growths the yield has run over 10 bushels per acre of clean, scarified seed.
>
> While Hubam clover has gained many friends the past year, the most uniformly enthusiastic group of men are the beekeepers. The most widely read and oldest bee journal in the United States carried extensive discussions of its merit, with many illustrations, in eight of the twelve issues of the year 1920.
>
> This clover was found growing in greenhouses at Ames by Professor Hughes in the winter 1915-16. When planted in the field it made a growth of be-

(Continued on page 454.)

Classified Advertisements

Notices will be inserted in these classified columns for 30c per line. Advertisements intended for this department cannot be less than two lines, and you must say you want your advertisement in the classified column or we will not be responsible for errors. Copy should be received by 15th of preceding month to insure insertion.

REGULAR ADVERTISEMENTS DISCONTINUED IN GOOD STANDING.

(Temporary advertisers and advertisers of small lots, when discontinued, are not here listed. It is only regular advertisers of regular lines who are here listed when their advertisements are discontinued when they are in good standing.)

J. N. Harris, J. H. Corwin, C. A. Mayeux, Ward Lamkin, Noah Bordner, F. D. Manchester, Chas. D. Sherman, Sterling Products Co., A. R. Harding, S. Rouse, J. L. St. Romain, R. O. Cox, Geo. W. Coltrin & Son, Dr. C. E. Sheldon, Geo. B. Howe, Dr. A. Wright, J. D. Harrah, L. C. Mayeux, L. R. Dockery, H. D. Rauchfuss, I. J. Stringham, Miss E. J. King, H. L. Murry, Federal Farm Loan Board.

HONEY AND WAX FOR SALE.

FOR SALE—Fancy clover honey in 60-lb. cans. Jos. Hanke, Port Washington, Wis.

FOR SALE—Choice clover extracted honey. State quantity wanted. J. D. Beals, Oto, Iowa.

FOR SALE—Choice white clover honey in 60-lb. cans—none finer. J. F. Moore, Tiffin, Ohio.

FOR SALE—Basswood and buckwheat honey in 60-lb. cans. Bert Smith, Romulus, N. Y.

FOR SALE—Fine quality raspberry milkweed honey in 5-lb. and 10-lb. pails and 60-lb. cans. P. W. Sowinski, Bellaire, Mich.

FOR SALE—2000 lbs. choice white clover extracted honey. State quantity wanted. Sample 20c, applied on first order. C. H. Hodgkin, Rochester, O.

FOR SALE—Finest quality, white sweet clover honey in 60-lb. tins, two to case, 12c. None better. F. O. B. Joe C. Weaver, Cochrane, Ala.

FOR SALE—Extracted clover honey, best quality at $14.40 per case of two 5-gal. cans. J. J. Lewis, Lyons, N. Y.

FOR SALE—Extra choice extracted white clover honey, put up in new 60-lb. cans and 5-lb. pails. Sample 20c, same to apply on first order. David Running, Filion, Mich.

FOR SALE—Clover, basswood or buckwheat honey, comb and extracted, by the case, ton, or carload. Let me supply your wants with this fine N. Y. State Honey. C. B. Howard, Geneva, N. Y.

FOR SALE—White clover honey, almost water white. Put up in new 60-lb. tin cans, two to the case. Write for prices. D. R. Townsend, Northstar, Mich.

FOR SALE—White honey in 60-lb. cans, sample and price on request. Also white clover comb, 24 sections to case. The A. I. Root Co., Inc., 23 Leonard St., New York City.

FOR SALE—White honey, 15c a lb.; L. A. alfalfa, 14c, in two 60-lb. cans; Chilian in 165-lb. kegs, 10c; light amber honey in 50-gal bbls., 80c a gal. Beeswax, 30c a lb. Walter C. Morris, 105 Hudson St., New York City.

FOR SALE—Finest quality clover extracted honey in new 60-lb. tins at greatly reduced price to close out balance of 1920 crop. Say how much you can use and we will be pleased to quote you our lowest price. Address E. D. Townsend & Sons, Northstar, Mich.

HONEY FOR SALE—In 60-lb. tins, immediate shipment f. o. b. New York. California white orange, 18c lb.; Calif. white sage, 16c lb.; white sweet clover, 13c lb.; light amber sage, 12c lb.; West Indian light amber, 10c lb. Hoffman & Hauck, Inc., Woodhaven, N. Y.

FOR SALE—New crop fancy white comb honey, No. 1 grade, $7.00 per case of 24 sections; No. 2 grade, $6.00. Extracted clover honey, 15c per pound; amber and buckwheat, 12½c per pound; two 60-lb. cans to case. Amber in 50-gal. barrels, 10c per pound. H. G. Quirin, Bellevue, Ohio.

RASPBERRY honey for sale. Was left on the hives until thoroly ripened by the bees. It is thick, rich, ripe and delicious. Put up for sale in new 60-lb. tin cans. Price, 2 cans in a case, $18.00. One can, $9.50. Sample by mail for 20c, which may be applied on order for honey. Elmer Hutchinson & Son, Lake City, Mich.

HONEY AND WAX WANTED.

WANTED—Comb honey, carlots or less. Heard & Woodhull, 4696 18th St., Detroit, Mich.

HONEY WANTED—Give particulars in first letter. Elton Warner, "Beaverdam," Asheville, N. C.

BEESWAX WANTED—For manufacture into SUPERIOR FOUNDATION. (Weed Process.) Superior Honey Co., Ogden, Utah.

BEESWAX wanted. Old combs (dry) and cappings for rendering. Also wax accepted in trade. Top market prices offered. A. I. Root Co. of Iowa, Council Bluffs, Iowa.

WANTED—All kinds comb and extracted honey and beeswax. Car lots or less—and full colonies of bees. W. C. Morris, 170 Rossiter Ave., Yonkers, N. Y.

WANTED—6000 pounds of off-grade extracted amber honey. Submit sample and quote price f. o. b. Terre Haute, Ind. W. A. Hunter, 119 S. 3rd St., Terre Haute, Ind.

WANTED—Shipments of old combs and cappings for rendering. We pay the highest cash and trade prices, charging but 5c a pound for wax rendered. The Fred W. Muth Co., Pearl and Walnut Sts., Cincinnati, O.

OLD COMBS WANTED—Our steam wax-presses will get every ounce of beeswax out of old combs, cappings, or slumgum. Send for our terms and our new 1921 catalog. We will buy your share of the wax for cash or will work it into foundation for you. Dadant & Sons, Hamilton, Illinois.

WANTED—Beeswax. We are paying 1 and 2c extra for choice yellow beeswax, and in exchange for supplies we can offer a still better price. Be sure your shipment bears your name and address, so we can identify it immediately upon arrival, and make prompt remittance. The A. I. Root Co., Medina, Ohio.

FOR SALE.

HONEY LABELS—New designs. Catalog free. Eastern Label Co., Clintonville, Conn.

FOR SALE—A full line of Root's goods at Root's prices. A. L. Healy, Mayaguez, Porto Rico.

ROOT'S goods at Root prices. A. W. Yates, 3 Chapman St., Hartford, Conn.

ROOT'S BEE SUPPLIES—For the Central Southwest Beekeepers. Beeswax wanted. Free catalog. Stiles Bee Supply Co., Stillwater, Okla.

PORTER BEE-ESCAPES save honey, time, and money. Great labor-savers. For sale by all dealers in bee supplies. R. & E. C. Porter, Lewiston, Ill.

FOR SALE—"SUPERIOR" FOUNDATION, "quality unexcelled." Let us prove it. Order now. Superior Honey Co., Ogden, Utah.

FOR SALE—5 Root Buckeye hives, complete, less frames, used one season. K. R. Fuller, Marengo, R. D. No. 2, Ohio.

FOR SALE or on shares, 14 apiaries, one or all. Healthful location with American school and church in town, on stone road. Last crop over 40 tons. M. C. Engle, Herradura, Cuba.

POWER rip and cross-cut saw, $30; Sun typewriter, $10; Peterson capping-melter, $6.00; lathe, $3.00; 3x5 printing press, type, etc., $8.00. Clarence Foote, Delanson, N. Y.

FOR SALE—Good second-hand five-gallon cans, two cans to the case; 10 cases, 60c each; 25 cases, 50c each. A. I. Root Co., 224 W. Huron St., Chicago, Ill.

ROOT'S BARGAIN LIST NO. 11.—Send a postcard for bargain list made to clean up odds and ends, discontinued styles, sizes and patterns, much of which is in the best of condition and entirely serviceable. A. I. Root Co., Medina, Ohio.

FOR SALE—40 10-frame Excelsior covers, painted, slightly used, 50c each; 42 8-frame Excelsior covers, KD, 40c each; 24 Miller feeders, nailed, new, 50c each.
C. C. Brinton, Bloomsburg, Pa.

EXTRACTORS—Root four-frame power, with pump and engine. Novice extractor. Hatch wax press. All new, never been used. Priced low for quick sale. E. J. Adkisson, West Nashville, R. D. No. 4, Tenn.

B GRADE SECTIONS—We have a small supply of B grade sections in several sizes which we offer subject to previous sale as follows, 4x5x1⅜ (Danz.), 3⅝x5x1½ (Ideal), 4¼x4¼x1½, and 4¼x4¾x1⅜ (N section). 500 for $5.00 net; 5000 for $45.00 net. The A. I. Root Co., Medina, O.

FOR SALE—Big bargain! Selling out, leaving the State. I will sell my fine apiary of 100 colonies of Italian bees in 8 and 10 frame new hives, and all up-to-date equipment for running same, on a buckwheat location, 30 miles west of Alexander's apiary in New York State, in village three miles from car line, includes all my honey customers, good for 4 tons of honey each season. Good will, etc., also includes house, one acre of good land, fruit, bee-cellar, honey house, etc. All for $1700 cash. Get busy and write me. Walter J. D'Alliard, Amsterdam, R. D. No. 5, N. Y.

FOR SALE—45 10-frame hive-bodies, with Hoffman frames, new, wired and foundation imbedded. $2.00 each; 35 10-frame hives, complete, NEW galvanized covers, $2.00 each; 35 8-frame hives, air-spaced hives, "not new," with drawn worker combs, $2.00 each; 30 10-frame hive-bodies with frames nailed and painted, "NEW goods," $1.50 each; 25 comb honey supers, 75c each; 30 feeders, 10c each. Standard supplies. First class in every way. No foul brood combs. Most of these supplies never been on the hive. Reason for selling, going in other business. "This is a big bargain." W. J. D'Alliard, "Glenville Apiary," Amsterdam, R. F. D. No. 5, N. Y.

WANTS AND EXCHANGES.

WANTED—Old combs and cappings for rendering on shares. Our steam equipment secures all the wax. Superior Honey Co., Ogden, Utah.

WILL exchange new phonograph for extractor and clover honey. For sale, nearly new Hatch wax press, $10.00. Olf Hegre, Madison, Minn., R. D. No. 2.

FOR SALE OR EXCHANGE—Two and three frame nucleus, Italian bees for Rhode Island chickens and brown Leghorns. 50 bushels prime recleaned white clover seed, 35c per pound. L. C. Mayeux, Lock Box 4, Hamburg, La.

MISCELLANEOUS

FOR SALE—400 bushels buckwheat, $1.60 per bushel. New grain bags, 30c extra.
Albert Bues, Wharton, Ohio.

FOR SALE—Auto trailer. Made for beeyard use. Pneumatic tires. Photo furnished. $60.00.
B. F. Kindig, East Lansing, Mich.

GOLDEN SEAL—A root used in medicine by every doctor in the country. The wild supply is about gone. Learn how to grow it by subscribing to Special Crops, a monthly magazine devoted to medicinal root culture. $1.00 per year, sample copy, 10c. The root is worth $4.00 per pound. Address Special Crops, Skaneateles, Box G, N. Y.

BEES AND QUEENS.

FINEST Italian queens. Send for booklet and price list. Jay Smith, R. D. No. 3, Vincennes, Ind.

WHEN it's GOLDEN, it's PHELPS. C. W. PHELPS & SON, Binghamton, N. Y.

FOR SALE—Italian queens and nuclei.
B. F. Kindig, E. Lansing, Mich.

PACKAGE BEES—Dependable Italian queens.
E. A. Harris, Albany, Ala.

HARDY Italian queens, $1.00 each.
W. G. Lauver, Middletown, Pa.

THAGARD ITALIAN QUEENS—See display advertisement elsewhere.

SIMMONS' ITALIAN QUEENS, bees and nuclei. Fremont Apiary, Livingston, N. Y.

SEE our large advertisement on page 454 for prices. Buckeye Bee Co., Justus, Ohio.

GOLDEN Italian queens, untested, 1, $1.25; 6, $7.00. E. A. Simmons, Greenville, Ala.

PHELPS' GOLDEN QUEENS will please you. Mated, $2.00. C. W. Phelps & Son, Binghamton, N. Y.

MY famous Italian queens, June 1 and later, $1.50 each, six for $8.00. J. W. Romberger, Apiarian, 3113 Locust St., St. Joseph, Mo.

IF you want queens that will produce results, give THAGARD'S ITALIAN QUEENS a trial.
V. R. Thagard, Greenville, Ala.

ITALIAN QUEENS—Recognized honey-gathering strain, June 10 (a little earlier if possible) until close of season. Untested, each, $1.75; 6, $10.00; 12, $18.50.
R. F. Holtermann, Brantford, Ont., Can.

FOR SALE—Golden and three-banded leather-colored Italian queens, untested, $1.50; tested, $2.00. Special inducements to large buyers of nuclei and package bees. J. B. Marshall & Son, Rosedale Apiaries, Big Bend, La.

FOR SALE—Root's strain of Golden and leather-colored Italian queens, bees by the pound and nuclei. Untested, $1.50 each; select untested, $2.00; tested, $2.50 each; select tested, $3.00. For larger lots write. Circular free. A. J. Pinard, 440 N. 6th St., San Jose, Calif.

FOR SALE—20 colonies bees in standard L. hives, $10.00 per hive. T. A. Kragness, 6031 Wentworth Ave., Chicago, Ills.

FOR SALE—Untested Italian queens, three-banded only, $1.50 each; 8.00 per half doz., $15.00 per doz. J. F. Garretson, Bound Brook, N. J.

QUEENS—Three-banded Italians, untested, $1.25 each; $12.00 for 12. Satisfaction guaranteed. J. D. Kroha, 87 North St., Danbury, Conn.

BEES AND QUEENS from my Carolina apiaries—progeny of my famous Porto Rican pedigreed-breeding stock. Elton Warner, Asheville, N. C.

FOR SALE—Golden Italian queens, 1 untested queen, $1.25; 1 tested queen, $3.00. J. F. Michael, Winchester, Ind.

THAGARD'S ITALIAN QUEENS produce workers that fill the supers quick. V. R. Thagard, Greenville, Ala.

FOR SALE—A few choice queens shipped in frame brood, $4.00 each. Jes Dalton, Bordelonville, La.

THE A. I. ROOT CO. pure leather-colored queens, untested, 1, $1.25; 6, $7.00. Greenville Bee Co., Greenville, Ala.

FOR SALE—Bright Italian queens, $1.50 each; $14.00 per doz. Ready after April 15. T. J. Talley, Greenville, R. D. No. 3, Ala.

FOR SALE—Golden queens, untested, 1.15; 6 or more, $1.10 each; select untested, $1.60; 6 or more, $1.50 each; safe arrival. Hazel V. Bonkemeyer, Randleman, R. D. No. 2, N. C.

FOR SALE—Leather-colored Italian queens, tested, until June 1, $2.50; after, $2.00; untested, $1.25; 12, $13.00. Root's goods at Root's prices. A. W. Yates, 15 Chapman St., Hartford, Conn.

FOR SALE—300 stands of bees in Standard hives, two-thirds equipped for comb honey and one-third for extracted honey. G. J. Westerik, Mt. Morrison, R. D. No. 1, Box 54, Colo.

BEES BY THE POUND — Also QUEENS. Booking orders now. FREE circulars giving details. See larger ad elsewhere. Nueces County Apiaries, Calallen, Texas. E. B. Ault, Prop.

FOR SALE—Golden or three-banded queens, untested only. Order now for shipment June 1 or later. One, $1.50; six, $8.00; 12, $15.00. Ross B. Scott, LaGrange, Ind.

FOR SALE—A. I. Root Co. strain of leather-colored Italians. Virgins only, May to October, 1, 75c; 10, $7.00; 100, $65.00. P. W. Stowell, Otsego, Mich.

FOR SALE—250 colonies Italian bees in 10-frame hives, free from disease. Also supers, combs and winter cases. Locations go with bees if wanted. Fred D. Lamkin, Poplar Ridge, N. Y.

FOR SALE—Five colonies of bees in double-walled Buckeye hives, all healthy. I am sick and can't take care of them. Will sell cheap. Alvin C. Vogt, Box 49, Kolze, Ills.

FOR SALE—Three-banded Italian queens, untested, $1.25; 6, $7.50; 12, $14.00. Tested queens, $2.50 each. The above queens are all select. Robt. B. Spicer, Wharton, N. J.

SHE-SUITS-ME queens, season of 1921. Untested Italians: After June 15, $1.50 each, up to nine queens; 10 to 24 queens, $1.40 each; 25 and up, $1.25. Allen Latham, Norwichtown, Conn.

WILLOW DELL queens and nuclei stand the test with any. Queens, $1.25; 2-fr. nuclei, $5.00; 4-fr., $8.00, including fine untested queen. Ready for delivery, receiver to return nuclei boxes collect. H. S. Ostrander, Mellenville, N. Y.

FOR SALE—20 colonies Italian bees. Good shape, in 8 and 10 frame modern hives. A. C. Gould, Weston, R. D. No. 4, W. Va.

FOR SALE—Hardy Northern-bred Italian queens and bees. Each and every queen warranted satisfactory. For prices and further information, write. H. G. Quirin, Bellevue, Ohio.

COLORADO QUEENS. Pure Italians. Our sunny climate and altitude produce the best there are. Write now for price list. C. I. Goodrich, breeder of fine queens, Wheatridge, Colo.

ITALIAN QUEENS OF WINDMERE are superior three-banded stock. Untested, $1.50 each; 6 for $8.00; tested, $2.50 each; select tested, $3.00. Prof. W. A. Matheny, Ohio University, Athens, O.

FOR SALE—Leather-colored Italian queens from Dr. Miller's breeder. Virgins, $1.00; mated, $1.50; tested, $2.50. F. R. Davis, Standfordville, Dutchess County, N. Y.

AM now ready to mail out young queens of Dr. Miller strain leather-colored Italians, by return mail, at $1.25 each. A few breeders for sale. S. G. Crocker, Jr., Roland Park, Baltimore, Md.

FOR SALE—Vigorous leather-colored Italian queens, famous three-banded stock, untested queens, $2.00 each; tested, $3.00; untested, $18.00 per doz. Order early. C. M. Elfer, St. Rose, La.

FOR SALE—Golden queens ready May 1; 1, $1.50; 6, $7.50; 12, $14.00; 100, $100. Virgins, 75c each. W. W. Talley, Greenville, R. D. No. 4, Ala.

FOR SALE—Three-banded Italian queens, $1.00 each, or $10.00 per dozen. I ship nothing but the best. Safe arrival guaranteed. William C. Smith, Calhoun, Ala.

FOR SALE—Golden Italian queens, untested, $1.15; 6 for $6.50; 12 or more, $1.00 each; tested, $2.00 each; select tested, $3.00 each; extra select tested, $4.00 each. No bees for sale. D. T. Gaster, Randleman, R. D. 2, N. C.

IF GOOD bright Italian queens are wanted by return mail, send your order to M. Bates, Greenville, Ala. Price, $1.00 each; $10.00 per dozen; $75 per 100. Pure mating, safe arrival, and satisfaction guaranteed.

FOR SALE—2-lb. packages Italian bees and queens by parcel post, postage paid, delivery April 15, for $8.50; 2-frame nuclei with Italian queen by express, not prepaid, delivery May 5, $9.00. Otto J. Spahn, Pleasantville, N. Y.

WE believe we have the best Italian queens obtainable. Our new system is working wonders. Book your order now for 1921. Untested, $1.50; tested, $3.00; virgins, imported mothers, 50c. F. M. Russell, Roxbury, Ohio.

FOR SALE—Packages, nuclei, and pure-bred queens—queens from Root Home-bred breeders. Untested, $1.50; tested, $2.50; select tested, $3.00. Safe arrival and mating guaranteed. The Southland Apiaries, Hattiesburg, Miss. W. S. Tatum, Prop.

WE are now booking orders for early spring delivery of two and three frame nuclei, with untested or tested queens. Write for prices and terms. We also manufacture cypress hives and frames. Sarasota Bee Co., Sarasota, Fla.

PURE ITALIAN BEES—Not the cheapest, but the best we can grow, both golden and three-banded, with clean bill of health. Sure to please. Such as we use in our own yards. Untested, $1.25; tested, $2.00. J. B. Notestein, Bradentown, Fla.

FOR SALE—Highest grade three-banded Italian queens, Untested, each, $1.25; 6, $6.50; 12, $12; 50, $47.50; 100, $90. Virgins, 45c each. No disease and satisfaction guaranteed. A. E. Crandall, Berlin, Conn.

FOR SALE—100 colonies bees, 100 hives in flat, no frames, with equipment, $1600; 120-acre farm with dwelling, $1900. Will sell separate or together. B. F. Averill, Howardsville, Va.

HAVING purchased leather queens from the best honey-gathering stock obtainable, we will rear a few three-banded queens in yards set apart for that purpose, at the following prices: Untested, $2.00; tested, $5.00; select breeders, $10.00. C. W. Phelps & Son, 3 Wilcox St., Binghamton, N. Y.

THREE-BANDED Italian only, that have been bred to a high standard of excellence. Never had disease in my apiaries. Safe arrival and satisfaction guaranteed. Untested queens, $1.50; 12, $15.00; tested queens, $2.25; 12, $25.00.
Jul Buegeler, New Ulm, Texas.

WHEN BETTER QUEENS are raised Victor will raise them. Three-banded Italians only, mated, $1.25 each; 6, $7.00; 12, $13.50; 100, $110.00. Tested, $3.00. Breeders, $10 to $25. Safe arrival guaranteed only in U. S. and Canada.
Julius Victor, Martinsville, N. Y.

BUSINESS-FIRST QUEENS—Are the bees that get the honey; are bright three-banded Italians; are gentle; have been inspected and found free from disease. Orders promptly filled. Untested, $1.00 each; select untested, $1.50; select tested, $2.50. Write for prices on larger orders.
M. F. Perry, Bradentown, Fla.

FOR SALE—Six 10-frame colonies of Italian bees with young queens, guaranteed free from disease. Combs built on Hoffman frames with full sheets foundation, wired. These are strong, powerful colonies, all ready for the honey flow. Price, $15.00 each, f. o. b. Port Chester. Van Collins, Riversville Road, Port Chester, N. Y.

"QUEENS, QUALITY FIRST QUEENS." High-grade, pure, three-banded and golden Italians. These queens are as good as can be bought; are gentle, prolific, and good honey-gatherers. I guarantee safe arrival and satisfaction. Why not try these and be convinced? Untested, $1.00 each; 6, $6.00; 12, $12.00; 50, $45.00. G. H. Merrill, Pickens, S. C.

HUMMER QUEENS—Untested, $1.00 each; $9.00 per dozen; tested, $1.50 each; $15.00 per dozen. A trial will convince you that they cannot be beaten. Safe arrival and satisfaction guaranteed. Nuclei at same old prices.
Geo. A. Hummer & Sons, Prairie Point, Miss.

FOR SALE—Italian queens: From July 1 to October 1, untested: 1, $1.25; 6, $7.00; 12, $13.50; tested, $2.00. I have a tested breeding queen from the A. I. Root Co., and will breed queens from her for those that prefer them to my old strain of hustlers. Safe delivery and satisfaction guaranteed. R. B. Grout, Jamaica, Vt.

ITALIAN QUEENS—Three-banded, select untested, guaranteed. Queen and drone mothers are chosen from colonies noted for honey production, hardiness, prolificness, gentleness, and perfect markings. Price after July 1, $1.25 each; one dozen or more, $1.00 each. Package bees a specialty. Send for circular. J. H. Haughey & Co., Berrien Springs, Mich.

TESTED Italian queens. These queens are descended from the celebrated J. P. Moore strain of leather-colored three-banded Italians. They are about one year old, have been tested out in full colonies, and are first class in every respect. Price $2.00 each, or $22.00 for 12. Safe arrival and satisfaction guaranteed. Elmer Hutchinson & Son, Lake City, Mich.

QUEENS—A SUPERIOR STRAIN. Bred from a queen whose colony gathered 200 lbs. honey while the other colonies did very little. Queens, untested, $2.00 each; tested, $3.00. Doolittle strain; queens, untested, $1.25; tested, $2.00. 40 years' experience in queen-rearing. Chestnut Hill Apiary, Aspers, Pa.

PHELPS' GOLDEN ITALIAN QUEENS combine the qualities you want. They are GREAT HONEY-GATHERERS, BEAUTIFUL and GENTLE. Virgins, $1.00; mated, $2.00; tested, $5.00. Breeders, $10 to $20. Safe arrival guaranteed only in the U. S. and Canada.
C. W. Phelps & Son, Binghamton, N. Y.

DAY-OLD QUEENS—1, 50c; 100, $50.00; 500, $250.00. Untested queens, $1.00 each. High quality three-banded Italians. Mailed in safety introducing cages. Delivery and satisfaction guaranteed in U. S. and Canada. Information in circular. Order early. James McKee, Riverside, Calif.

BRED strictly from the Dr. Miller granddaughter queens, $1.25 each, 6 for $7.25, 12 for $14.00; selects, 25c each higher; tested, just double price of untested. Breeders, $5.00; select breeders, $7.50 to $10.00 each; the best breeders, $15.00 each. One-frame nucleus with breeder for $1.00 extra. Curd Walker, Jellico, Tenn.

FOR requeening, use Williams heavy laying Italian queens. They produce hardy, hustling, three-banded workers. Bred from the best disease-resisting strain, and priced in accordance with the present price of honey. Untested, $1.25; 6 for $6.50; 12 or more, $1.00 each; tested, $2.00. Satisfaction guaranteed. P. M. Williams, Ft. Deposit, Ala.

NORTH CAROLINA bred Italian queens of the Dr. C. C. Miller strain of three-banded Italian bees, gentle and good honey-gatherers, from July 1 until Oct. 1. Untested, $1.25 each, $12.00 per doz.; tested, $2.00 each; select tested, $3.00 each. Safe arrival and satisfaction guaranteed. L. Parker, R. F. D. No. 2, Benson, N. C.

TO MY FRIENDS—I am still doing business at the old stand, producing some very fine Italian queens, hardy, prolific, good honey-gathering stock. Untested, $1.50; 6, $8.00; 12, $15.00. Write me for prices and date of delivery on quantities from 25 to 100. J. B. Hollopeter, Queen-breeder, Rockton, Pa.

FOR SALE—Until further notice we are offering our bright Italian queens, untested, at $1.00 each; $10.00 per dozen; $75 per 100. We guarantee safe arrival, pure mating and reasonable satisfaction in U. S. and Canada. Cash must accompany all orders unless parties are known or satisfactorily rated. Graydon Bros., Greenville, R. D. No. 4, Ala.

FOR SALE—Three-band leather-colored Italian queens of the J. P. Moore strain, hardy, prolific, hustlers, no disease. Safe arrival and satisfaction guaranteed. Prompt attention given all orders. 1 untested, $1.25; 12, $13.50; 1 select untested, $1.50; 12, $15.00; 1 tested, $2.00; 12, $19.00; 1 select tested, $2.50; 12, $25.00. Write for circular and further information. J. M. Cutts, Route No. 1, Montgomery, Ala.

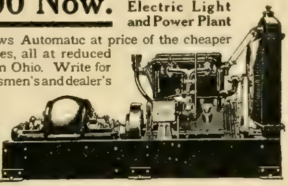
CALIFORNIA ITALIAN QUEENS, the old reliable three-banded stock that delivers the goods. Every queen actually LAYING before being caged, and fully guaranteed. I also guarantee safe arrival. SPECIAL FALL PRICES, select untested, 1, $1.25; 6, $7.00; 12, $13.00; 25 to 99, $1.00 each; 100 and over, 90c each. Package bees for next spring delivery. Circular free. California Apiaries, J. E. Wing, Prop., 155 Schiele Ave., San Jose, Calif.

PRITCHARD QUEENS (Three-banded Italians.)—Price, untested, $1.50 each, 6 for $8.00; select untested, $1.75 each, 6 for $9.50. A liberal discount will be given on larger quantities. I will have a few choice virgins, tested, and breeders to spare; write for prices. Queens clipped free of charge on request. Acknowledgment and directions for introducing sent on receipt of order. Safe delivery and satisfaction guaranteed. Specify date of shipment desired, otherwise orders will be filled in rotation. Arlie Pritchard, Medina, Ohio.

HELP WANTED.

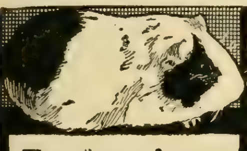
WANTED—One experienced man and students, clean habits, able-bodied and willing workers, as helpers with our more than 1000 colonies. Opportunity to learn the business from A to Z. 1920 crop 122,000 pounds. Theory also. Write immediately giving age, height, weight, habits, former employment, experience, references, wages, photo, all in first letter. E. F. Atwater (former Special Field Agent in Beekeeping, U. S. Dept. Agr.), Meridian, Idaho.

$295.00 Now. A Real 32-VOLT Electric Light and Power Plant



See the Matthews Automatic at price of the cheaper plants. Six sizes, all at reduced prices. Made in Ohio. Write for particulars. Salesmen's and dealer's best opportunity

The Matthews Engineering Co.
Farry Street
Sandusky, O.



Raise Guinea PIGS—FOR US!

We need men and women, boys and girls everywhere to raise Guinea Pigs for us. We tell you where to get them, show you how and buy all you raise. Big opportunity for money making. Thousands needed weekly.

Easy to Raise—Big Demand No special knowledge, **Large Profits** experience or equipment needed. They breed the year round—are very prolific—require but little space or attention. Pay better than poultry or squabs—cost less to house, feed, keep, easier raised—less trouble, market guaranteed. **FREE** Particulars, contract, and booklet how to raise

CAVIES DISTRIBUTING COMPANY
3145 Grand Avenue, Kansas City, Mo.
Largest Guinea Pig breeders and distributors in America.

"Best" Hand Lantern

A powerful portable lamp, giving a 300 candle power pure white light. Just what the farmer, dairyman, stockman, etc. needs. Safe—Reliable—Economical—Absolutely Rain, Storm and Bug proof. Burns either gasoline or kerosene. Light in weight. **Agents wanted. Big Profits. Write for Catalog.**

THE BEST LIGHT CO.
306 E. 5th St., Canton, O.

QUEENS

Quirin's Northern-bred hardy Italians now ready. Safe delivery and satisfaction guaranteed.

PRICES OF BEES AND QUEENS.
(After July 1st)

	1	6	12
Untested	$1.50	$ 8.00	$15.00
Tested	2.00	10.00	18.00
2-comb Nuclei	6.00	32.00	60.00
3-comb Nuclei	8.00	45.00	85.00
8-fr. Colony..	12.00	70.00	
10-fr. Colony.	15.00	85.00	
Breeders, fair			5.00
The very best, each......			10.00

Add the price of the queen wanted with nuclei or colony. This is our 30th consecutive season at queen-rearing.

Address all orders to

H. G. QUIRIN
BELLEVUE, OHIO

"QUEENS OF QUALITY"

3-band Italians only.

Untested, $1.25 each; six for $7.00; $12.00 per dozen.

We are now shipping by return mail.

J. I. BANKS
Dowelltown, Tenn.

High Quality Queens at Reduced Prices

Three-banded Italians, reared from best hustlers, non-swarming, gentle, and prolific. Satisfaction guaranteed. Health certificate with each shipment.

Untested	1 to 10, $1.00 each; over 10, $0.90 each
Select Untested	1 to 10, 1.25 each; over 10, 1.15 each
Tested	1.75 each

FRANK BORNHOFFER, R. R. 17, MT. WASHINGTON, OHIO

Talks to Beginners.—Continued from page 442.

and will gnaw away a part of the foundation as well as coat it over with propolis, thus rendering it unfit to use next season. At this time the bee-escape is especially useful in taking off either comb-honey supers or extracted-honey supers, for it is now more difficult to drive the bees out of comb-honey supers with smoke and to remove the combs of honey from extracting supers one at a time. Shaking and brushing off the bees is not an easy task for the beginner when robbers are troublesome.

Queens

Write for our catalog of high-grade Italian Queens. Pure mating and safe arrival guaranteed.

Prices for 1921.

1 to 4 inclusive	$3.00 ea
5 to 9 inclusive	2.90 ea
10 or more...	2.80 ea.
Breeders	12.00 ea.

Jay Smith

Route Three
Vincennes, Indiana.

INDIANOLA APIARY

will furnish 3-banded Italian bees and queens: Untested queens, $1.00 each; tested, $1.50 each. One pound bees, no queen, $2.00. No disease.

J. W. SHERMAN, VALDOSTA, GA.

NEW ENGLAND

BEEKEEPERS will find a complete stock of up-to-date supplies here. Remember we are in the shipping center of New England. If you do not have a 1921 catalog send for one at once.

H. H. Jepson, 182 Friend St., Boston 14, Mass.

GOLDEN OR THREE-BAND QUEENS.

Untested, balance of season, $1.00 each; doz. $10.00, or $80.00 per hundred. Virgins, 50c each, or $40.00 per hundred. All orders filled promptly or parties notified when to expect shipment; satisfaction.

R. O. COX, Rt. 4, Luverne, Ala.

PATENTS Practice in Patent Office and Court.
Patent Counsel of The A. I. Root Co.

Chas. J. Williamson, McLachlan Building,
WASHINGTON, D. C,

NEWMAN'S ITALIAN QUEENS Bred From the Best. Absolutely First Quality and fully guaranteed. No disease. Satisfaction and safe arrival. Untested, $1.50; 6, $8.00; 12, $15.00. Select Untested, $2.00; 6, $10.00. 12, $19.00. Circular free.

A. H. NEWMAN, Queen Breeder
MORGAN, KY.

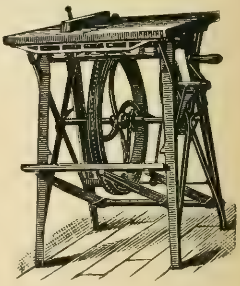
BARNES'
Hand and Foot Power
Machinery

This cut represents our combined circular saw, which is made for beekeepers' use in the construction of their hives, sections, etc.

Machines on Trial

Send for illustrated catalog and prices.

W. F. & JOHN BARNES CO
545 Ruby Street
ROCKFORD, ILLINOIS



MASON BEE SUPPLY COMPANY
MECHANIC FALLS, MAINE
From 1897 to 1921 the Northeastern
Branch of The A. I. Root Company

Prompt and Efficient Service BECAUSE—Only Root's Goods are sold.
It is a business with us—not a side line.
Eight mails daily.
Two lines of railway,
If you have not received 1921 catalog send name at once.

I. F. MILLER'S STRAIN
ITALIAN QUEEN BEES.

Northern bred for business; from my best SUPERIOR BREEDER (11 frames brood on April 7), gentle, roll honey in, hardy, winter well, not inclined to swarm, three-banded, 27 years' breeding experience. Satisfaction guaranteed. Safe arrival in U. S. and Canada. Untested, $1.50; 6, $8.00; 12, $14.00. Select, $1.75; 6, $9.00; 12, $17.00.

I. F. MILLER
Brookville, R. D. No. 2, Pa.

Queens—Rhode Island—Queens

Italian Northern-bred queens. Very gentle and hardy. Great workers. Untested, $1.25 each; 6 for $7.00. Circular on application.

Queens delivered after June 1.

O. E. TULIP, Arlington, Rhode Island
56 Lawrence Street.

STUTT'S ITALIAN QUEENS

are supreme queens; ready June 1. Untested, $1.25; 6, $6.50; 12, $12.50. Select untested, $1.50; 6, $8.00; 12, $15.00. Pure mating and safe arrival guaranteed.

ALFRED A. STUTT, Lincoln, Ills.

Leininger's Strain of Italian Queens

Have been carefully selected and bred for the past 38 years. Our queens are reared from selected stock taken from the best strains of Italian bees known. Neither trouble nor expense is spared to produce queens of unsurpassed quality. They have proved themselves to be not only great honey-gatherers but also very resistant to brood diseases.

We will have 400 select tested queens that we will sell as long as they will last at the folowing special prices:

PRICE LIST OF QUEENS.

Untested, $1.50 each; 6 to 25, $1.40 ea.
Sel. Tested, $3 each; 6 to 25, $2.75 ea.
Breeding queens, $10.00 each.

Every queen we send out we will guarantee to give fullest satisfaction.

FRED LEININGER & SON
DELPHOS, OHIO.

Lower Prices

Order from these quotations.
Write for complete price list.

Untested Italian Queens, each	$ 1.25
Untested Italian Queens, per 100	98.75
Two pounds bees with queen	5.75
Sections, No. 1 grade	12.85
Sections, No. 2 grade	12.25
Hoffman brood-frames, per M.	65.00
5-lb. friction top pails (200)	20.50
Cases of 5-gallon cans	1.35
5-gallon cans in bulk	41.75
Double-tier cases for comb honey, per 100	50.00

"Airco" Comb Foundation.

	1 lb.	25 lbs.	100 lbs.
Medium Brood	$0.85	$0.80	$0.75
Light Brood	.87	.82	.77
Thin Super	.90	.85	.80
Extra thin super	.92	.87	.82

"Airco Your Bees"

THE FOSTER HONEY & MERCANTILE CO.
BOULDER, COLORADO.

"Foster Your Business"

GOOD WILL AND GOOD QUEENS
ARE BACK OF
FOREHAND'S THREE BANDS
THE THRIFTY KIND

Good will has made our success.
Our good queens will make your success.

These two forces working together have made it possible for us to serve the beekeepers for over a quarter of a century.

Hearty support for twenty-nine years.

Good Queens for twenty-nine years.

Each is the proof of the other. Both are proof that you will not make a mistake when you requeen with Forehand's Three Bands—the bees that are **surpassed by none but superior to many.**

Good queens are the success of an apiary. Your success is ours. We try to help you in every way. We give you good queens and good service. We guarantee pure mating, safe arrival, and satisfaction.

We are now booking orders for immediate delivery.

Write for circular giving full information on bees and queens.

Pure mating and satisfaction guaranteed the world over. Safe arrival in U. S. and Canada.

Prices:	1	6	12
Untested	$1.25	$6.50	$11.50
Select Untested	1.50	7.50	13.50
Tested	2.00	10.00	18.50
Select Tested	2.75	15.00	27.00

Write for prices in large quantities.

W. J. FOREHAND & SONS
FORT DEPOSIT, ALABAMA

NOTICE!

Pritchard Queens

are not just common queens named, but

A NOTED STRAIN

The result of years of careful breeding and selection. Reared and offered for sale by

ARLIE PRITCHARD

Medina, Ohio.

See my classified ad, page 450 for prices and guarantee.

Established 1885.

Write us for catalog.

BEEKEEPERS' SUPPLIES

ALWAYS ON TOP

The Kind You Want and the Kind That Bees Need.

We have a good assortment in stock of bee supplies that are mostly needed in every apiary. The A. I. Root Co.'s brand. Let us hear from you; information given to all inquiries. Beeswax wanted for supplies or cash.

John Nebel & Son Supply Co.

High Hill, Montgomery Co., Mo.

Colonies of Italian Bees

in good standard Danzenbaker, Langstroth, and Jumbo hives at reduced prices during July, August, and September. A1 in all respects. Write for prices. Satisfaction guaranteed.

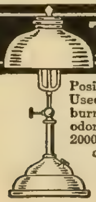
VAN WYNGARDEN BROS.

R. F. D No. 4, Hebron, Indiana.

LARGE, HARDY, PROLIFIC QUEENS

Three-band Italians and Goldens. Pure mating and safe arrival guaranteed. We ship only queens that are top notchers in size, prolificness, and color. After June 1st: Untested queens, $1.50 each; 6 for $8.00; 12 or more, $1.40 each; 25 or more, $1.25 each. Tested queens, $3.00 each; six for $16.00.

Buckeye Bee Co., Justus, Ohio.



The "BEST" LIGHT

Positively the cheapest and strongest light on earth. Used in every country on the globe. Makes and burns its own gas. Casts no shadows. Clean and odorless. Absolutely safe. Over 200 styles. 100 to 2000 Candle Power. Fully Guaranteed Write for catalog. AGENTS WANTED EVERYWHERE.

THE BEST LIGHT CO.

306 E. 5th St., Canton, O.

Hubam Clover.—Continued from page 446

tween 4 and 5 feet, while medium red clover under exactly the same conditions made a growth of only 5 inches and biennial sweet clover 14 inches.

In order to meet the widespread demand for seed of this clover the Iowa Experiment Station offered last spring to give small samples of seed to any farmer in the United States who would send a stamped, self-addressed envelope to carry the sample of seed to him. As a result over 47,000 samples of seed were distributed. Six or seven thousand additional requests for seed were received, but owing to the fact that no postage was enclosed the seed was not sent.

I want to call particular attention to the statement above of SIX OR SEVEN THOUSAND applications for seed not only without an addressed envelope, but without any postage; and, by the way, this reminds me many times down in my Florida home good friends asked for seed, or something I have written up, and not only omitted postage which I don't care so much about, but they didn't even send an addressed envelope or postal card. Then I am obliged to hunt the letter sometimes from beginning to end to find out *who* sent it and *where* they live.

World's Best Roofing at Factory Prices

"Reo" Cluster Metal Shingles, V-Crimp, Corrugated, Standing Seam, Painted or Galvanized Roofings, Sidings, Wallboard, Paints, etc., direct to you at Rock-Bottom Factory Prices. Positively greatest offer ever made.

Edwards "Reo" Metal Shingles

cost less; outlast three ordinary roofs. No painting or repairs. Guaranteed rot, fire, rust, lightning proof.

Free Roofing Book

Get our wonderfully low prices and free samples. We sell direct to you and save you all in-between dealer's profits. Ask for Book No. 183

LOW PRICED GARAGES

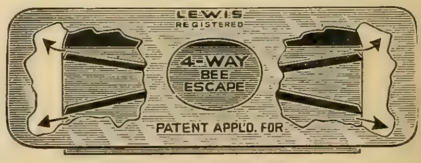
Lowest prices on Ready-Made Fire-Proof Steel Garages. Set up any place. Send postal for Garage Book, showing styles.

THE EDWARDS MFG. CO.,

733-783 Pike St., Cincinnati, O.

FREE Samples & Roofing Book

LEWIS 4-WAY BEE ESCAPES



Four exits from supers. Fits all standard boards. Springs of coppered steel. Made of substantial metal. Made by

G. B. Lewis Company, Watertown, Wis., U.S.A.

Sold only by Lewis "Beeware" Distributors.

ROOT'S BEE SUPPLIES

Carload stocks at Ohio's distributing center. Orders filled the day they come in. Save time and freight by ordering from

A. M. MOORE, Zanesville, Ohio
22½ S. Third Street.

QUEENS

Now for the profit from good queens and strong colonies.

GENTLE THREE-BAND ITALIANS

Untested, $1.25. 12 or more, write for price.

Prompt Service.

D. W. HOWELL
Shelman, Ga.

QUEENS

Select Three-Banded Italians. I have one of the most modern queen-rearing apiaries in the South, and am breeding from the best Italian stock to be found. Pure mating, prompt and safe arrival guaranteed.

	1	6	12	50
Untested ..	$1.25	$7.00	$13.00	$50.00
Tested	3.00	16.00	30.00	

Write for descriptive circular and prices on queens in lots of 100 or more.

HARDIN S. FOSTER,
Dept. G, Columbia, Tenn.

QUEENS OF MOORE'S STRAIN OF ITALIANS PRODUCE WORKERS

That fill the super quick
With honey nice and thick.

They have won a world-wide reputation for honey-gathering, hardiness, gentleness, etc. Untested queens $1.50; 6, $8.00; 12, $15.00 Select untested $2.00; 6, $10.00; 12, $19.00 Safe arrival and satisfaction guaranteed. Circular free.

I am now filling orders by return mail.

J. P. MOORE, Queen Breeder
Route 1, Morgan, Kentucky

MOTT'S NORTHERN-BRED ITALIAN QUEENS.

For July: Sel. Untested, $1.25 each; $15.00 per doz. Sel. guaranteed pure-mated or replace, $1.75 each; $18.00 per doz. Sel. Tested $2.50. Filling orders by return mail now with the aid of my Southern branch. Plans "How to Increase' 'and "Introduce Queens," 25c.

E E. MOTT, Glenwood, Mich.

Golden and Three-Banded Queens

Northern Queens for Northern Beekeepers

THE DEPARTMENT OF CONSERVATION
STATE OF INDIANA
Division of Entomology
INDIANAPOLIS, IND.

Indianapolis, Jan. 17, 1921.

Mr. Ross B. Scott, Lagrange, Ind.

Dear Mr. Scott: I am pleased to learn that you anticipate enlarging your queen-rearing department, since the increased production of high-grade queens, such as you have been sending out, is of vast importance.

During the past year I have had the opportunity of seeing a large number of queens, and their bees, bought of you; and I commend you for your careful selection, care in shipping, and excellent quality of stock furnished your customers.

Last season I helped to introduce 147 golden Italian queens, bought of you by members of a county association; they were a beautiful lot of queens; all arrived in fine condition; and, as they were to be received on three different days, the fact that they arrived on exactly the days you promised is a feature of efficiency much appreciated by beekeepers. Wishing you continued success, I am, yours very truly,

C. O. YOST, Chief Inspector Apiaries.

Untested queens till July 15: One, $1.50; six, $8.00; dozen, $15.00. Safe arrival and satisfaction.

ROSS B. SCOTT, Lagrange, Indiana

Buy Your Bee Supplies Now

Take advantage of early-order discounts by ordering NOW. We guarantee to please you. "Prompt service and the very best" is our motto. *We want your beeswax and old comb.* Highest cash and trade prices offered. Texas beekeepers should write A. M. HUNT, Goldthwaite, Texas.

Manufactured by

Leahy Manufacturing Company
95 Sixth St., Higginsville, Missouri.

Write for FREE catalog. It is to your interest.

QUIGLEY'S QUEENS AND BEES

Three-banded Italians are bred from ideal colonies by double grafting, producing queens of superior quality; 20 years building this strain from the best honey-producing colonies. No disease; 35 years in this location.

Tested, each, $2.00; untested, each, $1.25; $12.00 per dozen.

Write for prices on nuclei, 2-lb. packages and full colonies.

Purity and satisfaction guaranteed. Send for circular.

E .F. QUIGLEY & SON
Unionville, Mo.

Spicer's Three-Banded Italian Queens

now ready to mail. These queens are bred so as to have all the desired qualities, hustlers, hardy, and gentle.

	1	6	12
Untested queens	$1.25	$7.50	$14.00
Tested queens	2.50	15.00	28.00

I do not list select queens, as the above are all select. Safe arrival and satisfaction guaranteed.

ROBERT B. SPICER
Wharton, N. J.

Three-Band and Golden QUEENS

That produce hustling bees. Bred to fill the supers. From the finest breeding strains obtainable. Hustlers, long-lived, and as beautiful in size and color as can be. Special price for summer and fall, $1.50 each; 25 at $1.25 each. Tested, $2.50 each. This is your time to requeen.

DR. WHITE BEE CO.
SANDIA, TEXAS.

THAGARD'S ITALIAN QUEENS
BRED FOR QUALITY

My three-banded queens are bred from imported stock; they are hardy, prolific, disease-resisting and honey producers. A good queen is the life of any colony; head your colony with some of our queens, place our queens against any queens you may obtain anywhere, **and note the results.** I do not breed for **quantity,** but breed for **quality.** My queens have proven this to thousands of beekeepers that have tried them. Book your order now for July to October delivery.

July 1 to Oct. 1:	1	6	12
Untested	$1.25	$6.50	$12.00
Selected Untestd	1.50	8.00	15.00
Tested	2.00	10.00	20.00
Select Tested	3.00	16.50	30.00

Safe arrival, pure mating, and perfect satisfaction guaranteed. Circular free.

V. R. THAGARD
GREENVILLE, ALABAMA

THE OLD RELIABLE THREE-BANDED ITALIANS

Our Italians are of an exceptionally vigorous and long-lived strain of bees. They are gentle, prolific. very resistant to foul brood, and the best of honey-gatherers. We have sold a good many queens to parties who are using them in stamping out foul brood. If you want the very best quality for the lowest price, send us your orders at once. Will guarantee safe arrival in the United States and Canada.

July to November:	1	6	12
Untested	$1.25	$6.50	$12.50
Select Untested	1.50	8.00	15.00

No nuclei or pound packages of bees for sale.

W. T. PERDUE & SONS
Route 1, Fort Deposit, Ala.

3-BANDED QUEENS QUEENS OF UNSURPASSED QUALITY **GOLDEN QUEENS**

Our queens are reared from selected stock taken from the best strains of Italians known. Neither trouble nor expense is spared to produce queens of unsurpassed quality. They have proved themselves to be not only great honey gatherers but also very resistant to disease, especially European foul brood. Every queen sent out by us we guarantee to give fullest satisfaction.

Price List of Our Queens:

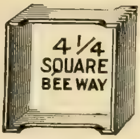
Untested	$1.25 each;	6 to 25, $1.10 each;	25 and up, $1.00 each
Select Untested	1.50 each;	6 to 25, 1.40 each;	25 and up, 1.25 each
Tested	2.25 each;	6 to 25, 2.10 each;	25 and up, 2.00 each
Select Tested	2.75 each;	6 to 25, 2.50 each;	25 and up, 2.25 each

Wings clipped free of charge. Safe arrival we guarantee. We have no disease in our apiaries.

OHIO VALLEY BEE CO., BOX 307, CATLETTSBURG, KY.

A BIG BARGAIN IN 4¼ x 4¼ x 1⅞

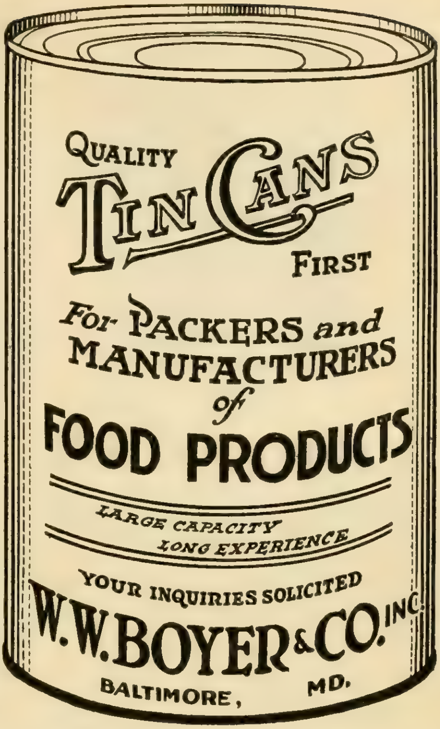
Sections



A Grade, $6.90 per 500
B Grade, $6.65 per 500

We have an odd lot stock A and B grade sections not manufactured for our regular grade, size 4¼ x 4¼ x 1⅞. We recommend both the A and B grades as a bargain. The A grade is strictly fine, and B grade is quite as good except for color and imperfections. Stock limited and we urge quick action. A grade in crates of 500 at $6.90, B grade at $6.65. Available only in crates of 500.

THE A. I. ROOT COMPANY.
224-230 W. Huron St., Chicago, Ill.



NORMAN BROS.' QUEENS

Mr. Beekeeper, if you want good quality, quick service, prompt attention, and perfect satisfaction, TRY NORMAN BROS. pure three-banded Italians and see for yourself. We are not going to say that we have the best in U. S. A., but we do say that we have as good as can be bought for the money. Our bees are hardy, gentle, prolific, disease-resisting and honey-gatherers. Orders filled promptly by return mail or your money refunded. We guarantee pure mating, freedom from all diseases, and safe arival in U. S. A. and Canada. Remember that you take no risk when you deal with us. Isn't that enough said!

Prices for July:	1	6	12
Untested Queen..	$1.50	$7.50	$13.50
Select untested...	1.75	8.25	16.00

Tested ....$3.00 each
Selected Tested .... 3.50 each

NORMAN BROTHERS' APIARIES, Naftel, Alabama

BANKING BY MAIL AT 4%

PROGRESS means going forward all the time. You cannot afford to stand still.

Ready money enables you to progress. Build up your "Future Opportunity" fund in this bank. Our BANKING BY MAIL booklet explains. We will gladly forward.

THE SAVINGS DEPOSIT BANK Co.
A. T. SPITZER, Pres.
E. R. ROOT, Vice Pres. E. B. SPITZER, Cash.
MEDINA, OHIO

QUEENS

FROM SELECT BREEDING

21 Years of Experimenting. We have nothing but the very best.

3-BAND ONLY

Price Cash With Order.

Before July 1st.

Untested	$1.50
Selected	2.25
Tested	3.00
Selected	3.50

Orders filled in rotation. Write for prices in large quantities.

Did you get what you were looking for when you bought your last year's Queens? If not, try one that will please you. My queens are reared on a new system, large and prolific, surpassed by none but superior to many. No complaint last year.

F. M. RUSSELL
IMPORTER
ROXBURY, OHIO R. F. D. No. 2

QUEENS AND BEES

We have one of the most modern queen-rearing outfits in the United States, and are breeding from new imported Italian blood. We produce QUALITY instead of QUANTITY.

A limited number of orders for spring delivery will be accepted at the following prices:

Quantity	1	6	12	24
Untested	$2.00	$11.40	$21.60	$40.80
Sel. Untested	2.25	12.80	24.30	45.90

Special price of $1.50 each on untested queens for June delivery in lots of 12 or more, if booked in advance.

We are also prepared to furnish full colonies, nuclei, and pound packages. Write today for prices.

The A. I. Root Co. of Texas
P. O. Box 765,
SAN ANTONIO, TEXAS.

Major's Queens Are Selected

Bright three-banded Italian queens. They are northern-bred; they are hardy and will see you next spring.

Having bred up my bees during the past eighteen years from the very best breeders obtainable thruout the United States, I now have a strain surpassed by none. They are the kind that clean up European foul brood and add to your banking account.

Pure mating, safe arrival and satisfaction guaranteed. Orders filled by return mail. Queens' wings clipped according to your directions.

Price: $1.50 each, or $15 per doz. Tested, $3.00 each; virgins, 50c each.

H. N. MAJOR
SOUTH WALES, N. Y.

Take Notice, Beekeepers

We have for June delivery 500 packages bees with untested queens at reduced prices. When you buy bees from us you know they will arrive in good condition. This is our eleventh successful year in shipping bees to all parts of U. S. and Canada. Remember you take no chances. We stand good the loss. One and two lb. packages are shipped on a standard Root-Hoffman brood-frame with brood and honey, which insures safe arrival.

One pound bees and queen	$4.00
Two pounds bees and queen	5.00
Two-frame Nucleus and queen	4.75
Three-frame Nucleus and queen	5.50
Untested queen without bees, ea.	1.25
12 for	12.00
Selected Tested, each	1.75

The above stock is three-banded only. We ship by express only. We guarantee no disease and safe delivery.

Where satisfaction comes from.

OSCAR MAYEUX
Lock Box No. 15.
HAMBURG, LA.

Quality Bee Supplies From a Reliable House

¶ Without fear or favor I place my BEE SUPPLIES and SERVICE before you.

¶ It is the small annoyances that often grow into disastrous results. Avoid the so-called "little losses" by using MONDENG'S goods. Quality is first—save time when you put your goods together by getting supplies that are accurately made. Service is next—no delays when bee supplies are ordered from my factory.

¶ I am ready to meet your urgent needs. Send for my latest price-list.

¶ Closing out all Langstroth and Wisconsin hives and supers. Also Langstroth triangular top-bar frames, and eight-frame D. T. supers for 4 x 5 sections. At cost price, write for quotations.

Charles Mondeng

146 Newton Ave. N. &
159 Cedar Lake Road.
MINNEAPOLIS, MINNESOTA.

Beeswax Wanted

In big and small shipments, to keep Buck's Weed-process foundation factory going. We have greatly increased the capacity of our plant. We are paying higher prices than ever for wax. We work wax for cash or on shares.

Root Bee Supplies

Big stock, wholesale and retail. Big catalog free.

Carl F. Buck

The Comb-foundation Specialist
August, Kansas
Established 1899.

Completely Destroys the Weed Growth

More than that, the BARKER breaks the hardest crust into a level, porous, moisture-retaining mulch — **all in the same operation.**

A ten-year-old boy can run it—do more and better work than ten men with hoes. Saves time and labor, the two big expense items.

BARKER WEEDER, MULCHER AND CULTIVATOR

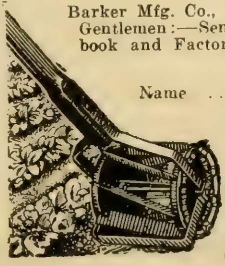
Eight reel blades revolve against a stationary underground knife—like a lawn mower. **BEST WEED KILLER EVER USED.** Works right up to plants. Cuts runners. Aerates the soil. Has leaf guards, and shovels for deeper cultivation—3 *garden tools in* 1.

FREE ILLUSTRATED BOOK.

Tells how gardeners and fruit-growers everywhere are reducing their work; increasing their yields.—How to bring growing plants through a dry season.—How to conserve the moisture and force a larger, more rapid growth. Send TODAY for this free, illustrated book and special Factory-to-User offer.

BARKER MANUFACTURING COMPANY

Dept. 23. David City, Neb.



Barker Mfg. Co., Dept. 23, David City, Neb.
Gentlemen:—Send me postpaid your free book and Factory-to-User offer.

Name ....

Town ....

State ....

R. F. D. or Box......

Southern Headquarters

Reliable Three-Banded Italian Queens

For several years our queens have been used and recommended by a number of the foremost beekeepers in the U. S. and Canada. We cannot afford to disappoint them, and we *will not* disappoint you.

Having several hundred colonies in outyards to select breeding stock from, and large well-equipped queen-rearing yards, we are sure we offer you something good. We pay special attention to honey-gathering qualities, but do not forget gentleness, beauty, etc. Our queens are good to look at, and their bees a pleasure to work with.

PRICES: Untested, $1.25 each; six, $7.50; twelve, $13.50; fifty or more, $1.00 each. Tested, $2.00 each.

Prompt service, safe arrival of queens, and satisfaction, we guarantee. Any queens that prove to be mismated will be replaced free of charge. No foul brood or other contagious bee disease has ever been in our vicinity.

W. D. ACHORD, Fitzpatrick, Alabama.

"Order Supplies in Advance of Needs"

---says a well-known beeman.

"Supplies should always be on hand in advance of needs. A dozen reasons may cause delay, and valuable time and money may be lost. This must be borne in mind if we would reap the largest possible harvest of honey. I have seen a colony fill a super with honey in five days. If we had waited a week or ten days for sections or foundation, we would have lost heavily during the honey flow."

Order **"falcon"** Queens and bee supplies for best results. Used by successful beemen for over 40 years. Shipped anywhere; safe arrival guaranteed.

W. T. Falconer Mfg. Co., Falconer, (NEAR JAMESTOWN) N. Y., U.S.A.

"Where the best beehives come from."

Distributor for the Central West, WM. H. RODMAN, 2027 Main Street, Gateway Station, Kansas City, Mo.

SECTIONS! SECTIONS!! SECTIONS!!!

While our present stock lasts we give the opportunity to buy No. 2 sections at a big reduction. We offer as follows:

No. 2—4¼x4¼x1⅞ 2-beeway Sections, per thousand . . $8.00
No. 2—4¼x4¼x1½ Plain Sections, per thousand 7.00
No. 2—4 x5 x1⅜ Plain Sections, per thousand 7.00

We are pleased to announce a big reduction in Bee Supplies. Send us a list of the goods you wish to purchase and we will quote you our new reduced prices.

AUGUST LOTZ COMPANY, BOYD, WIS.

SELECT THREE-BANDED ITALIANS OF THE HIGHEST QUALITY ONE GRADE

800 honey-gathering colonies from which to select the very best breeders. No one has better bees than I. Can make prompt delivery by return mail. I have not yet disappointed a customer.

PRICES: Untested (to July 1): each $1.50; 12 or more $1.25 each. After July 1, 1 to 49 $1.25 each, 50 or more, $1.00 each. Tested (to July 1), each $2.00. Breeders (to July 1), $25.00 each.

Pure mating, safe arrival, and satisfaction guaranteed. It is left with customer to say what is satisfaction.

A new customer from Missouri, where you have to show them writes: "The dozen queens arrived promptly. They are the most beautiful I ever saw."—(Name on request.)

Another one from the same state writes: "Your 100 2-lb. packages averaged 90 pounds surplus honey per colony, 10 pounds more per colony than the other 2-lb. packages purchased elsewhere."—H. H. Thale, Durham, Mo.

Now listen to this, from Ontario, Canada: "Bees and queens purchased of you last season all wintered without a single loss. Save me 50 untested queens for May delivery."—(name on request.)

My customers say my queens stand the northern winters. They are bred up for this, combined with the highest honey-gathering qualities and prolificness.

JASPER KNIGHT, Hayneville, Ala.

QUEENS FULL COLONIES AND NUCLEI QUEENS

Our bees are hustlers for honey, prolific, gentle, very resistant to European Foul Brood, our customers tell us. For years we have been shipping thousands of queens and pounds of bees all over the U. S. A. and Canada. We are continually getting letters with statements such as the following: "Well pleased with your stock," "Best we ever had," "The bees we got from you are the tops (best) we have in our 225 colonies," "Bees arrived in fine shape, well pleased," etc., etc. Write for circulars giving details, etc. We are quoting a lower price for balance of the year, but will still hold up the high standard of quality.

I have a good proposition for 2 or 3 Northern beekeepers that would like to come South this fall. Write for particulars.

QUEENS AFTER JULY 1st, BALANCE OF THE YEAR:

Untested	$1.35 each;	25 or more, $1.00 each
Select Unt. ..	1.50 each;	25 or more, 1.25 each
Tested	2.25 each;	25 or more, 1.75 each
Select Tested..	2.75 each;	25 or more, 2.00 each

1 lb. of bees.	$2.25 each;	25 or more, $2.13 each
2 lbs. of bees	3.75 each;	25 or more, 3.56 each
3 lbs. of bees	5.25 each;	25 or more, 4.98 each

Add price of queen wanted when ordering bees.

Safe arrival guaranteed within six days of here.

NUECES COUNTY APIARIES

E. B. AULT, Prop. **CALALLEN, TEXAS**

QUEENS BY SELECTION

BEES IN NUCLEI AND FULL COLONIES ONLY

Our system of Queen Rearing enabled us to stabilize our prices early, therefore we were not forced to make drastic cuts to get business enough to keep us busy. Another reason is that we we have always been satisfied with a fair margin of profit. When it comes to quality we take no back seat; complimentary letters from satisfied customers are proof that our guarantee holds good.

By always starting far more cells than we expect to use, and selecting only the best for introduction, and killing any queens that emerge defective or otherwise below par, we have no culls to send out. We have used breeders of many popular strains, and those that we have selected for use are reproducing themselves most satisfactorily. Drones reared from queens that are the pick of our outyards.

Truly, queens by selection, and we offer them to you at prices that will make them the best investment you can make, whether used for making increase or merely to requeen.

Prices for balance of season as follows: Select untested, $1.25 each; 25 or more, $1.00 each. Tested, $1.75 each; Select Tested, $3.00 each. Breeders, $5.00 each.

Nuclei, with select untested queens, 2-frame, $5.00; 3-frame, $6.50; 8-frame colony, $15.00; 10-frame, $17.50, with young tested queens, in new hives, combs drawn from full sheets.

Safe arrival and satisfaction guaranteed.

JENSEN'S APIARIES, CRAWFORD, MISS.
R. F. D. NO. 3.

Money Saved *Time Saved*

Bee Supplies

Root's Goods With Weber's Service

Send us a list of your wants, and we will quote prices that will save you money.

C. H. W. Weber & Co.

2163-65-67 Central Ave. Cincinnati, Ohio

Forehand's Queens

They Satisfy---Why?

Because of 28 years of experimental work, with both queen-breeding and honey-production. With breeding and selecting of imported queens, I have reached a standard which is ideal. Queens as good, but none BETTER. Why experiment? Take advantage of the life experience of my breeders.

OUR SERVICE STATION—We are ready to serve you at all times, whether you desire queens or advice. Let us help you with your bee problems. All questions are cheerfully answered.

I BREED THREE-BANDED ITALIANS ONLY.

June 1 to Nov. 1.	1	6	12
Untested	$1.50	$ 7.50	$13.50
Selected Untested.	1.75	9.00	16.50
Tested	2.50	13.00	24.00
Selected Tested ..	3.00	16.50	30.00

Bees in two-pound packages, 1 package, $6.00; 25 or over, $5.80; 50 or over, $5.40; 100 or over, $5.00, without queens. Will begin shipping bees as early as weather will permit.

Orders booked now for spring delivery. One-fourth the full amount with order and balance when shipment is desired. Pure mating, safe arrival, and perfect satisfaction guaranteed. Write for circulars and large-order discounts. Foreign orders at receiver's risk.

N. Forehand, Ramer, Alabama

Guaranteed Hubam Clover

Annual White Sweet Clover

(Hughes Variety)

All of the annual white sweet clover seed of the 1920 crop was exhausted before May 1st. But seed of an early strain, planted in Texas after Christmas, 1920, began to reach maturity early in May. This seed is now available.

You can get it in time to test it this year. It blooms for bees in three or four months, and continues to bloom for a much longer period than most plants used for the purpose. Many beekeepers have declared it to be the greatest clover yet tried. It combines quick growth with an unusual wealth of honey-making blooms. It is also a legume that returns a large amount of plant food to the soils. It has frequently been described editorially by Gleanings in Bee Culture.

Big profits are possible growing seed for your neighbors, and the farmers and beekeepers of your locality.

The price is now $5.00 a pound. Order from the Henry Field Seed Co., Shenanodah, Iowa, or direct from the grower who guarantees.

The De Graff Food Company, Seed Dept. 303, De Graff, Ohio

HONEY! HONEY! HONEY!

There are many beekeepers who do not produce enough Honey to supply their trade. Many of them are buying their extra needs from us. The particular advantage we can offer is a uniform Honey at all times at a reasonably low price. Our special blend of Fancy Honey is of a fine mild flavor, and is always uniform. This honey is liquid in various-sized tins. For those who prefer it we can supply any grade of the best-flavored Table Honeys, granulated in 60-lb. tins.

SPECIAL BLEND OF FANCY HONEY (Liquid)

60-pound Tins, 2 per case	**14c per lb.**
10-pound Tins, 6 per case	**16c per lb.**
5-pound Tins, 12 per case	**17c per lb.**
2½-pound Tins, 24 per case	**18c per lb.**

Water White Sweet Clover Honey, 60-lb. Tins, granulated, 13c lb.
Calif. Extra L. A. Sage Honey, 60-lb. Tins, granulated, 12c lb.

GLASS AND TIN HONEY CONTAINERS

2½-lb. Cans, 2 dozen reshipping cases	$1.45 case; crates of 100,	$ 6.50
5-lb. Pails (with handles), 1 dozen reshipping cases	1.35 case; crates of 100,	8.30
10-lb. Pails (with handles), ½ dozen reshipping cases	1.10 case; crates of 100,	12.75

60-lb. Tins, 2 per case—NEW, $1.30 case; USED, 50c.

WHITE FLINT GLASS, WITH GOLD LACQD. WAX LINED CAPS.

8-oz. Honey Capacity, Cylinder Style	$1.50 per carton of 3 dozen
16-oz. Honey Capacity, Table Jar Service	1.40 per carton of 2 dozen
Quart or 3-lb. Honey Capacity, Mason Style	1.00 per carton of 1 dozen

Hoffman & Hauck, Inc., Woodhaven, New York

Quality Queens at Quantity Prices

BREED THREE-BAND ITALIANS ONLY

1921 PRICES.

	1	6	12
Untested	$1.50	$8.00	$15.00
Select Untested	1.75	9.25	16.80
Select Tested	3.00	16.50	30.00
Breeding queens with 2-frame nuclei			$15.00 each

Queens are reared from mothers whose colonies are GENTLE, HARDY, and as HONEY GATHERERS will compare with any.

I rear all my queens personally by the latest and most approved methods, which insures queens that are capable of duplicating the excellent characteristics of their mothers. The foundation for your next season's crop should be laid NOW by heading your colonies with my young vigorous queens.

You take absolutely no risk in ordering my queens for I guarantee satisfaction and safe arrival in U. S. A. and Canada.

I have pleased others and can please you as well. Please give shipping date, otherwise your order will be filled in rotation. Foreign shipments at receiver's risk. Health certificate with each shipment.

I sell no bees by the pound nor nuclei ONLY with high priced breeding queens.

HERMAN McCONNELL, ROBINSON, ILLINOIS

3-BANDED Highest Quality of Italian Queens GOLDEN

Twenty-five years of Select Breeding from the Best

After 25 years of select breeding, not all of the time in a commercial way, but as large honey producers, therefore rearing a great number of queens for our own use, we have strains of pure Italian bees which we believe are unexcelled for honey production, disease-resisting qualities, beauty, and gentleness. Owning about 1,500 colonies of bees which we run for honey, gives us ample opportunity to test them out in every way. As our apiary interests extend as far north as northern Ontario, we test them not only for honey production but also from a climatic standpoint. We find that our bees stand the long winters there with very satisfactory results. They are very hardy and long-lived. *Listen what others say about them:*

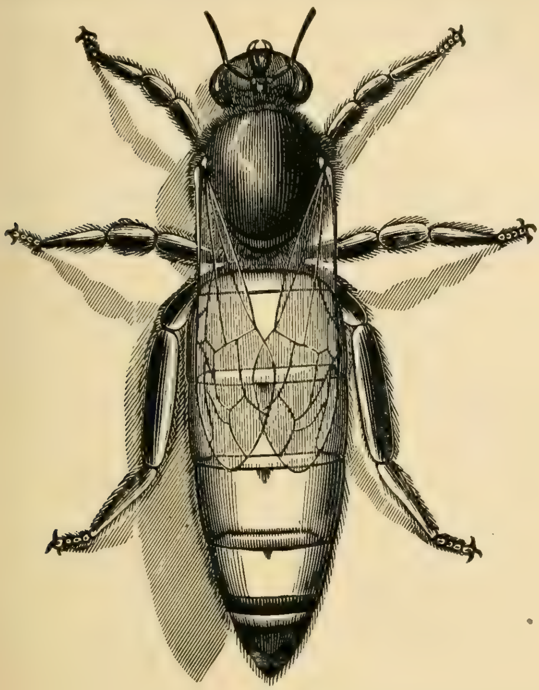
> "M. C. Berry & Co., Hayneville, Ala.: The queens I got from you have all the others skinned! They are very gentle, best of workers, and stand the long winters here finely. Other queens coming from a shorter distance do not hold a candle to them."—Gilbert Plains, Man., Canada. (Name on request.)
>
> "M. C. Berry & Co.: I wish to inform you that one of your queens made the most honey of any in the yard. It made 250 pounds honey against an average of 103 pounds for the yard. All of your queens made good. I never have had a queen from you that did not return a big per cent on the investment."—Marion, Ind. (Name on request.)
>
> "M. C. Berry & Co.: One of your queens built up from a nucleus and made 360 pounds of surplus honey. Enclosed find $75.00 for 50 queens. I want these for requeening European foul brood colonies as I find your stock resistant."—Troy, Pa. (Name on request.)

PRICE LIST OF OUR QUEENS.

Untested	$1.10 ea.;	6 to 50, $1.00 ea.;	50 to 100 and up, $0.90 ea.
Select Untested	1.25 ea.;	6 to 50, 1.10 ea.;	50 to 100 and up, 1.00 ea.
Tested	2.25 ea.;	6 to 50, 2.10 ea.;	50 to 100 and up, 2.00 ea.
Select Tested	2.50 ea.;	6 to 50, 2.35 ea.;	50 to 100 and up, 2.25 ea.
Breeders			$25.00 to $35.00 each.

Queens' wings clipped free of charge. Safe arrival and satisfaction guaranteed.

M. C. BERRY & CO., HAYNEVILLE, ALABAMA, U. S. A.



From the finest stock possible.
Bred by most skillful
queen-breeders.

Highest Quality
Prompt Service
Satisfaction

Our Reliable Three-Banded Italian Queens

NOTICE, MR. BEEKEEPERS!—Queens are off. Now is your time for business. Times are getting back to normal. Let us figure with you on your needs. We now have a large stock of queens, and we positively guarantee that no better can be found in U. S. A. We spare neither labor nor money in rearing them. When you buy queens from us and after arrival you examine them carefully, we trust to your judgment and if you don't think they are all we claim them to be, return them to us and we will return your money. That is not all we have to say. After you have introduced them to your colonies and they don't prove to your satisfaction and are not what you expected them to be, just call on us and we will send more to take their places or return the money. We do not want your money unless you are positively pleased. Why we say this about our queens is because we know that queens of the highest quality obtainable are what you want and you will certainly be pleased. It is our aim to rear them to speak to purchaser for themselves, and we feel free for purchaser to be the judge. Please remember the deal is not closed until satisfaction is given. When a fairer deal can be made we will do it. They are bred by the most skillful queen-breeders of long-tested experience, both as honey producers and queen-breeders. The queens are bred from the very finest stock that can be and are mated to only selected drones. Having been carefully bred from grafting until they begin laying, from the very best stock, and mated to selected drones means queens that cannot be excelled, which we guarantee.

PRICES

	1	6	12	100
Untested	1.00	$5.00	$ 9.00	$70.00
Select Untested	1.15	6.00	10.50	76.50
Tested	2.00	10.00	18.00	
Select Tested	3.00	12.00	20.00	

Write for prices on larger quantities.

THE FARMER APIARIES, RAMER, ALABAMA

"Where the good queens come from."

How about pails and cans, shipping cases and cartons? We can supply you promptly.

Shipments by MAIL, EXPRESS, OR FREIGHT. Write us for quotations.

The Good Old Summer Time Is With Us Again

R U going to make that crop of honey the biggest ever? Let us help you.

ORDER NOW

F. A. SALISBURY

1631 West Genesee Street
SYRACUSE, N. Y.

New York State Beekeepers, send for our catalog.

You want something in our line AT ONCE. Send in your order; we will do our best to meet your requirements.

We are here to give you the best in QUALITY, SERVICE, and SATISFACTION.

Low Prices Again

---and the stage all set for a big honey season

40 per cent off on frames

35 per cent off on hives and the general line sections and cases.

And on all Quality Goods, which we can send to you immediately.

Get our prices before ordering, for

When We Cut, We Cut

The A. I. Company of Iowa

Council Bluffs, Iowa

(Continued from page 405.)

form in which it is taken from the hive, wax and honey being intermingled.

Practically all of the honey now produced in California is extracted honey. In 1916, 81 per cent of the California commercial production was sold in such form. In 1917, 82 per cent; in 1918, 90 per cent; in 1919, 97 per cent, and in 1920, 96 per cent. In the United States approximately 55 to 60 per cent of all honey produced is sold as extracted honey. Comb honey is relatively unimportant in California, production of such honey in 1920 amounting to only 2 per cent of the total amount of honey produced in the State. This is the result of the gradual change to extracted honey, as in 1916 approximately 18 per cent of California honey was sold as comb honey.

The production of comb honey is exceptionally difficult and its lasting qualities are such that it is hard to market comb honey outside of the state in which it is produced. As a consequence, the bulk of the comb honey sold in the United States is that produced and sold locally in various eastern States. In 1916 and 1917, 38 per cent of all the honey produced in the United States was produced in the form of comb honey. In 1918 the percentage was 31 per cent, and in 1919 and 1920, 30.5 per cent.

Approximately 10 per cent of the honey produced in the United States is sold as chunk honey. In California only one to two per cent of all honey produced is sold in this form.

The principal markets for honey moving thru the regular channels of trade are reported as Medina, Ohio; Cincinnati, New York City, Chicago, Kansas City, Philadelphia, and Boston. It is estimated, however, that approximately 90 per cent of the honey produced in the country, with the exception of the California production, does not get twenty miles from the home of the honey producer.

In the past the markets for commercially produced honey have been, to a great extent, foreign markets. In 1919 there were 9,105,362 pounds of honey exported from the United States. The principal importing countries were the United Kingdom, which imported 2,882,951 pounds; France, which imported 1,129,704 pounds; Sweden, which imported 1,128,152 pounds; Belgium, which imported 922,008 pounds; the Netherlands, which imported 690,595 pounds; Denmark, which imported 417,492 pounds, and Canada, which imported 297,414 pounds. While these exportations to foreign countries during 1919 were slightly larger than normal exportations, because of the sugar shortage, they may nevertheless be taken as indicative of the proportion of American produced honey formerly absorbed by foreign markets.

At present, these markets are being definitely closed to United States honey producers. In 1920 there were only 1,539,725 pounds of honey exported from the United States of America, almost 50 per cent less than total exportations to Great Britain during 1919 and approximately 83 per cent less than total exportations during 1919.

Several factors are closing these foreign markets to American honey producers. The first of these is the depreciation in foreign exchanges, which is making it exceptionally difficult for foreign countries to purchase American produced goods. This situation may be only temporary and the organization of the new $100,000,000 Foreign Trade Financing Corporation may materially assist in stabilizing exchanges.

The other factor which is closing foreign markets to American productions is probably permanent. Thruout the world, companies are being formed to further honey production. Cheap labor costs and inferior methods in handling honey will probably assure these corporations a comparative monopoly on foreign honey markets.

The situation is made doubly serious by the fact that many of these companies are formed with the express purpose of exploiting United States markets. They are shipping quantities of extracted honey into the New York market. This honey, it is alleged, is sometimes shipped into the United States in containers, consisting of previously used casks, barrels, and even five-gallon oil cans. This imported honey is not produced under sanitary conditions and may even contain bacilli larvae, which are germs of a very contagious disease, similar to the boll weevil in the cotton industry. Consequently, efforts are being made to secure an emergency protective tariff of not less than 5 cents per pound upon every pound of honey imported into the United States from foreign markets. The purpose of this tariff is not only to protect United States honey from competition with foreign honey, but is also to protect the honey industry from possible inroads which these larvae might make upon the bee of the United States, if importation is permitted to continue. A movement to require rigid inspection of imported honey and rejection of any honey containing injurious larvae could do much to correct this evil, but present attempts by producers seem to be directed toward efforts to secure tariff protection.

The United States honey industry is today definitely faced with the fact that it must rely almost entirely upon domestic markets in the future. In the past it has been the custom to market domestically produced honey in five-gallon cans, containing sixty pounds of extracted honey. As a general rule, two of these cans form a case. A considerable proportion of this honey was retailed direct from the can into containers belonging to the consumer.

The baking trade in the United States has used large proportions of the United States produced honey in preference to sugar, because it permits the holding of a certain proportion of moisture in baked goods. As commercial baked goods tend to dry and chip if sugar is used, honey is considered superior for sweetening purposes.

In order to better exploit local markets a new means of marketing honey is fast gaining in favor in the United States and is being pushed by co-operative honey associations in California. Honey is being put up for the retail trade in one pound, two and a half pound, five-pound, and ten-pound friction-top cans, and in eight-ounce and sixteen-ounce glasses. These containers carry a label showing the name of the canning company and the source of the honey, so that its cleanliness can be vouched for. Active steps are being taken to develop larger home markets for this new form of honey. The food value of honey is unquestioned as it contains 1485 heat calories per pound

High railroad freight rates are interfering with the marketing of California produced honey, and active steps are being taken to secure a reduction in these rates, so that California honey can enter the eastern markets of the United States. With the development of water transportation, thru the Panama Canal, it is anticipated that increasing amounts of California honey can enter eastern markets at cheaper transportation costs. It is being found that co-operative marketing of honey, as at present carried on in California, is reducing the cost of marketing honey by several cents per pound, thereby assisting in profitable marketing. The California Honey Producers' Co-operative Exchange, with head offices in Los Angeles, markets the honey of approximately 85 per cent of the California commercial producers.

The problems which the honey industry of the United States, and particularly of California, are facing today are, therefore, three-fold. The first is the securing of an effective means of excluding any infected foreign honey, the second is a reduction in freight rates to eastern markets, the third is the preparation of honey in more marketable forms and the development of larger consumption in the United States. The first of these problems will require Congressional action. The solution of the second will be made easier thru the development of water transportation thru the Panama Canal, and the ready response which is being made in retail markets to the new forms of marketing honey will go a long way in solving the third problem.

Honey prices have dropped materially in the past year, because of general readjustment and because of the closing of foreign markets. While in 1918 and 1919 and the earlier part of 1920 the prices for the better grades of California honey in Los Angeles markets ranged between 18 and 23 cents, these prices have now dropped to as low as 12 and 13 cents. Predictions as to future honey prices cannot be made with any accuracy today, but indications are that with the developments of new domestic markets the excess honey formerly shipped to foreign markets will tend to be absorbed in the United States.

Michigan Tradesman. E. H. Tucker.

40 PER CENT DISCOUNT
ON PRICES OF
ROOT QUALITY BEES AND QUEENS

The kind that is better. Over fifty years' experience in raising bees and queens. Thousands of satisfied customers in every part of the globe are using our bees.

ROOT QUALITY QUEENS

Now is your opportunity to requeen your colonies with the famous Root Quality Three-Banded Leather-colored Italian Queens at a very small expense. No doubt you have been thinking of doing this for some time but you did not feel that you could do so at former prices.

One of the most practical beekeepers that ever lived made the following statement: ''Upon no other one thing does the honey part of the apiary depend so much as it does upon the queen.''

DEDUCT 40% FROM THESE PRICES.	July-Oct.
Untested queens	$2.00
Selected untested	2.50

Our Guarantee on Queens.

We guarantee safe arrival of queens sent in mailing cages. We agree to replace the queen if the one first sent arrives dead or is so feeble that she dies before she can be introduced, provided the beekeeper receiving the dead or unfit queen returns her at once and in her own shipping cage. This guarantee applies only on queens sent to customers in U. S. and Canada.

ROOT QUALITY BEES

There is a growing demand for bees in modern up-to-date hives. To meet this demand we are prepared to furnish full colonies of bees on Hoffman frames, wired, with combs drawn from full sheets worker foundation in new single-walled 8-or 10-frame hives and double-walled Buckeye hives.

DEDUCT 40% FROM THESE PRICES.	Wt.	July-Oct.
Colony in new 1-story 8-frame hive	55-65 lbs.	$18.50
Colony in new 1-story 10-frame hive	65-75 lbs.	20.00
Colony in new 1-story Buckeye hive	75-85 lbs.	22.50

No queens furnished at the above prices. If queen is wanted, make a selection and add her price to the above.

NUCLEI.

Our nuclei are shipped by express in light wooden boxes with wire screen top and bottom. It is necessary to have on hand hives into which to transfer the nuclei on arrival and then add frames containing full sheets of foundation to the nuclei as they increase in strength.

DEDUCT 40% FROM THESE PRICES.	Wt.	July-Oct.
1-frame Nucleus without queen	4- 7 lbs.	$3.50
2-frame Nucleus without queen	9-12 lbs.	5.50
3-frame Nucleus without queen	12-16 lbs.	7.50
5-frame Nucleus without queen	22-27 lbs.	10.50

DEDUCT 40% FROM THESE PRICES.	Wt.	July-Sept.
1-lb. package of bees without combs	3 lbs.	$3.50
2-lb. package of bees without combs	5 lbs.	5.50
3-lb. package of bees without combs	7 lbs.	7.50

No queen is supplied at these prices. If queen is wanted, make a selection and add her price to the above.

NOTE:—No one should buy bees in pound packages unless he has hives with combs or frames with full sheets of foundation in readiness.

THE A. I. ROOT COMPANY, MEDINA, OHIO
WEST SIDE STATION

HONEY

TURN IT INTO
MONEY

ALL SWEETS HAVE EXPERIENCED SENSATIONAL DECLINES.

THE WORLD'S SUPPLY OF SUGAR IS ESTIMATED AT 1,250,000 TONS IN EXCESS OF REQUIREMENTS.

VERMONT MAPLE SYRUP IS ONE-HALF OF THE 1920 PRICE.

IF YOU HAVE HONEY SELL IT EARLY.
IF YOU CANNOT SELL IT, WE CAN.

◆

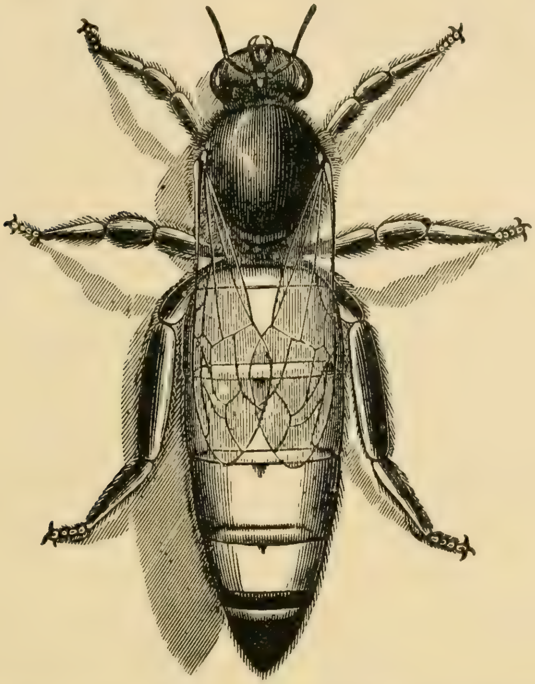
MONEY FOR HONEY

◆

PATON & COWELL

217 BROADWAY
NEW YORK

The Queen of Queens



Bred from the best of breeding queens—selected Root home-bred breeders. Reared in the Sunny South, hardy and prolific. Southland queens will keep the hive overflowing with bees. It takes two brood-chambers to house a Southland Queen, and her followers.

QUEENS

(After July 1st.)

Day-old virgins	$1.00 ea.
100 or more	.50 ea.
Untested	1.25 ea.
25 or more	1.00 ea.
100 or more	.75 ea.
Tested	2.25 ea.
25 or more	2.00 ea.

NUCLEI

Two-frame nucleus, no queen	$4.50
Three-frame nucleus, no queen	6.00

PACKAGES

(Shipped on comb of foundation)

1-pound package bees	$3.00 ea.
2-pound package bees	5.00 ea.
3-pound package bees	7.00 ea.

25 or more either size, 25c less per lb. each package.

SPECIALS

1-fr. brood and pound bees with untested queen	$4.50
2-fr. nucleus with young tested queen	6.50

Special attention to large orders and contracts. Get our bids on queens for your apiary. Health certificate with each shipment.

THE SOUTHLAND APIARIES

W. S. TATUM, PROP. BOX 585, HATTIESBURG, MISS.

ITALIAN BEES AND QUEENS

GOING BACK TO NORMAL

Our "motto" is to give the beekeeper the very highest quality Italian Queens, Bees, and Beekeepers' Supplies at the lowest cost possible. Conditions make the following low prices possible. An absolute quality guarantee on everything we sell. Our intention and desire are to stay in the business, and to stay we have got to give you quality goods, therefore, you run no quality risk in ordering from us.

o o o

QUEENS AND BEES.

After June 15th: Untested Queens, $1.00 each; 12 or more, 75 cents each. Tested, $2.00. Breeders, $5.00 to $25.00. Package Bees shipped from Mayhew, Miss., or Helena, Ga.: 1-lb package, $2.00; 2-lb. package, $3.75; 3-lb. package, $5.25. One, two, and three-frame nuclei at the above prices. Add price of queen wanted.

o o o

During May we reared 3496 queens. To date we have had only three complaints which were adjusted at once. Safe arrival and satisfaction guaranteed.

o o o

THE STOVER APIARIES, MAYHEW, MISS.

ROOT'S DISCOUNT SALE

Based on present prospective raw material cost and wage reduction, The A. I. Root Company has reduced bee supply prices to help get the nation's business "back to normal" as promised on page 2 of our 1921 spring catalog.

Discounts now in effect are as follows:

40 Per Cent

FRAMES (all styles K. D.)
BEES: Full Colonies, Nuclei, and Pound Packages
UNTESTED QUEENS
SEL. UNTESTED QUEENS
CARTONS (For comb honey)

35 Per Cent

SECTIONS
SHIPPING CASES

25 Per Cent

HIVES (flat)
INSIDE FURNITURE
HONEY-BOARDS
CAGES, BEGINNERS' OUTFITS

10 Per Cent

HONEY and WAX EXTRACTORS
SMOKERS
KNIVES, TRAPS
METAL GOODS

AIRCO COMB FOUNDATION is reduced 10 cents per pound.

Write at once for Catalog, Bargain List, and Discount folder if you have not received them. Now is the time to complete your equipment---extractors, honey boards, traps, smokers and veils, bees and queens.

Supplies ready at hand---Foundation, sections, cartons, shipping cases, glass and tin containers, will save time which may be used in producing more honey.

No discount on Buckeye hives, books, tin or sundry unnamed items. These discounts have no relation whatever to any price quoted in our close-out lists or elsewhere. They apply only to our regular 1921 catalog—114th edition.

THE A. I. ROOT COMPANY, MEDINA, OHIO

New York, Chicago, Philadelphia, Norfolk, St. Paul, Indianapolis, New Orleans

LOWER PRICES

Did you get our announcement mailed to our list in June of new, low, retail prices on ''Beeware'' effective at once? If not, write us. Our catalog is free. There is a distributor near you. ''Beeware'' quality is the same.

BARGAIN LIST

Write for our bargain list. There are dozens of good bargains in it. We will send it free upon request. A few of the 95 good buys are listed below. F. O. B. Watertown:

8 and 10-fr. wood and zinc excl., old style at	50c each
30G frame wire, 335-ft. spools at	6c each
Black bristle bee-brushes at	15c each
Pepper box bee-feeders, pint size at	5c each
Lewis section formers at	90c each
Boardman feeders, old style, K. D.,	15c each
Colorado section-presses, at	57c each
A lot of No. 2 Lewis sections, odds, at	$7 per M.

LOOK FOR THIS

BEE HIVES AND APIARIAN EQUIPMENT
BEWARE
WHERE YOU BUY YOUR
BEEWARE
WATERTOWN WIS. USA
MAKES THE FINEST.
COPYRIGHT, 1916 BY G B LEWIS COMPANY

REGISTERED MARK

G. B. LEWIS COMPANY
Home Office and Works, Watertown, Wis., U. S. A.
Branches: Memphis, Tenn.; Albany, N. Y.;
Lawyers (near Lynchburg), Va.
Carlot Distributors Throughout the U. S. A.

achusetts
AUG 2 - 1921
Agricultural
College

Gleanings in Bee Culture

"The labors of summer are ended,
Its triumphs and failures are past." —*Eugene Secor.*

VOL. XLIX AUGUST, 1921 NUMBER 8

We are now running 1000 Colonies for Queens and are prepared to accept orders for Queens in large quantities and make immediate delivery. Each Queen selected and prepared for mailing by our Queen-breeder personally. They are going out in every mail, and to have yours in time to use them this season better get your order in the next mail. Also let us have your list of supplies, so we can quote you our very best prices.

MILLER BOX MANUFACTURING COMPANY
201 North Ave. 18.
Los Angeles, California.

"Griggs saves you freight."

TOLEDO

By the time you read this our 1921 crop will be history. How about your Honey Cans, Comb-honey Cases, Extractors? Let us know your wants. We can serve you promptly and well.

Honey, New Crop

Send sample and say how much you have, kind, how packed, and price asked in first letter.

Beeswax always wanted.

THE GRIGGS BROS. CO.
Dept. 25 Toledo, O.

"Griggs saves you freight."

The Old Reliable Three-Banded Italians

Booking orders now for 1921. Queens ready April 1st. My Italians are of an exceptionally vigorous and long-lived stock strain of bees. They are gentle, prolific, very resistant to foul brood, and the best of honey-gatherers. I have sold a good many queens to parties who are using them in stamping out foul brood. Orders booked for one-fourth cash, balance before delivery. Will guarantee safe arrival in the United States and Canada. Descriptive circular and price list free.

	Prices April, May, and June			July to November		
	1	6	12	1	6	12
Untested	$1.50	$8.00	$15.00	$1.25	$6.50	$12.50
Select Untested.	1.75	9.00	16.00	1.50	8.00	15.00
Tested	2.50	12.50	24.00	2.25	12.00	22.00
Select Tested ..	3.00 each			$3.00 each		

No nuclei or pound packages of bees for sale.

JOHN G. MILLER
723 C Street
Corpus Christi, Texas

BETWEEN SEASONS

We are taking inventory, repricing stock in line with present cost of materials. Because of decreasing values we expect to show a loss for the past year. We are in good company in such a result, for there are doubtless many among the people we serve, who will show a similar result for the season. We are hopeful for the future and are prepared to give better service than ever before. When in need of anything used by beekeepers let us hear from you. Yours for service,

THE A. I. ROOT COMPANY OF CALIFORNIA
1824 E. 15th St., Los Angeles, Calif. 52-54 Main St., San Francisco, Calif.

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THE A. I. ROOT COMPANY, Publishers, Medina, Ohio

Editorial Staff

Geo. S. Demuth and E. R. Root	A. I. Root	Iona Fowls	H. G. Rowe
Editors	Editor Home Dept.	Assistant Editor	M'n'g Editor

Honey ***Wanted*** *Honey*

We are in the market for both comb and extracted. Send sample of extracted, state how put up, with lowest price, delivered Cincinnati. Comb honey, state grade and how packed, with lowest price, delivered Cincinnati. We are always in the market for white honey, if price is right.

C. H. W. Weber & Co.

2163-65-67 Central Av., Cincinnati, Ohio

HONEY CANS

Several carloads just received at our Ogden and Idaho Falls warehouses. We also manufacture shipping cases and beehives. Special prices on request. "Everything in Bee Supplies." Prompt shipments.

SUPERIOR HONEY CO., OGDEN, UTAH

(Manufacturers of Weed Process Foundation.)

WANTED---COMB HONEY

We are in the market for 10 to 20 carloads. Must be 4¼ x 4¼ x 1⅞ in beeway sections. Describe the quality, grade, and quantity, and when you will have it ready for shipment. Will take less than carload lots, if fancy and well packed in carrier. Also Extracted Honey—send sample.

HOFFMAN & HAUCK, INC., WOODHAVEN, N. Y.

Shake with H. N. MAJOR, South Wales, N. Y. Mr. Major is one of the leading Queen Breeders for his age. Keep your eye on him, he will be a second Doolittle. The other week Major wrote us like this: ''I have worn all kinds of veils from homespun to factory-made—but for real work and comfort give me a 'MUTH IDEAL.' '' Order one today, $1.50.

FRICTION TOP CANS

	Per 100.	Per 10.
2½-lb. cans	$ 4.25	$ .50
5-lb. cans	8.00	1.00
10-lb. cans	12.00	1.40

60-LB. SQUARE CANS

Used cans, good and clean, packed two in each crate. 1 to 9 crates, 70c per crate; 10 to 99 crates, 65c per crate; 100 crates or more, 60c per crate.

1-LB. SCREW TOP HONEY JARS

2 dozen to case. 10-case lots, $1.75 per case; 100-case lots, $1.70 per case.

HONEY

We are in the market for Comb and Extracted Honey. Send us a sample and tell us how much you want for it delivered to Cincinnati. We remit the day the shipment is received. No waiting for your money when you ship to MUTH.

BEESWAX RENDERING

From the looks of our Wax Rendering Department some of your wives read our advertisements. As soon as they read about saving the muss around the house and her wash-boiler she must have said, ''John, you send that old comb to MUTH. No more mussing around this place.''

Send for shipping tags or mark your name and ours plainly on the barrels. We will render the old comb and pay you the market price for wax, less 5c per pound for rendering.

ITALIAN QUEEN BEES

PURE STRAIN.

Untested: 1, $1.50; 6, $8.50; 12, $15.00.
Tested Pure: 1, $2; 6, $10.50; 12, $18.

SPECIAL **SPECIAL**

HONEY EXTRACTORS

No. 5 Novice 2-frame (a good little extractor)	$25.00
No. 15 Cowan 2-frame (A wonder for speed)	$32.75

THE FRED W. MUTH COMPANY

Pearl and Walnut Streets
CINCINNATI, OHIO

HONEY MARKETS

U. S. Government Market Reports.

SHIPPING POINT INFORMATION FIRST HALF OF JULY

CALIFORNIA POINTS.—Supplies of old crop cleaning up. New crop supplies are heavier. Movement is light. Little wire inquiry being received, and market is weaker. Carloads f. o. b. usual terms at leading points, per lb., white orange, new crop, wide range in prices, 8½-10c, mostly 9c; light amber alfalfa, old crop 5-6c, water white alfalfa new crop 7½-8c, white mesquite 6¾c, white sage old crop 8½-9c, new crop 9-10c; light amber sage old crop mostly 7½c, new crop 7½c. Hawaiian f. o. b. San Francisco, white Hawaiian 6c, light amber 4½c, honeydew honey, dealers asking 4c. Producers are not inclined to sell at present prices. Current prospects are that the alfalfa crop will be below normal. Orange and sage will both have very short crop, sage ranging around 35% of last year's yield. Beeswax producers are selling more than during the last of June on account of extracting having been completed. Market is weaker but movement better. Dealers paying mostly 25c per lb. for crude wax.

INTERMOUNTAIN (IDAHO AND UTAH).—White sweet clover is quoted in carload lots at 7c per lb., f. o. b. loading station. In smaller quantities, white alfalfa-clover honey is moving at 12c per lb. White sweet clover in Arizona is said to be offered at 7c per lb. For average grade beeswax 26-30c is being paid.

MIDDLE-WESTERN STATES.—Thruout the Plains States white clover was partly winter-killed and dry, hot weather has since rendered the prospects still more unfavorable for a good flow of honey. Bees are said to be in good condition and healthy, altho few new swarms have come off.

CENTRAL STATES.—As usual, there is little movement of honey at this season of the year. There is said to be the best flow from sweet clover experienced in years. White clover is also producing well, altho curtailed by drought. The average yield is reported as around 50 lbs. per colony, with best colonies reaching 100 lbs. American foul brood is abundant in some localities, but otherwise the condition of the bees is normal. Local demand is good in some places, but carlots are moving slowly. White clover has been bought in large lots at 8c per lb., f. o. b., with small lot sales ranging around 15c for extracted and $6.00 per 24-section cases for No. 1 comb. Beeswax is being bought for 26c per lb. in cash or 29c in trade.

NORTHEASTERN SECTION.—Due to abnormal weather conditions bees have not yet gathered much surplus. Recent heavy rains, however, may improve the fall flow of nectar. Fair prospects are expected for the buckwheat flow. A few small-lot sales of light amber are being made at 15c. Yellow beeswax is bringing around 27c per lb.

SOUTHEASTERN SECTION.—The honey crop in North Carolina is reported to be a complete failure; and thruout the rest of the South the flow is very light, due partly to dry, hot weather. The market is slow, and little honey is changing hands. A few sales of white honey are reported at 10-12c per lb. in small lots.

PACKAGE HONEY F. O. B. CALIFORNIA POINTS.—Fancy new crop white orange honey in small containers is being quoted f. o. b. California shipping points as follows: 2-lb. tins, 48 to the case, $10.00 per case; 5-lb. tins, 12 to the case, or 10-lb. tins, 6 to the case, $11.00 per case.

TELEGRAPHIC REPORTS FROM IMPORTANT MARKETS.

BOSTON.—1 car Porto Rico via New York City arrived since last report. Stocks on hand only moderate. Slightly better inquiry for extra-good extracted honey reported. Comb honey is slightly weaker with little interest shown. Comb: Sales to retailers, New York, 24-section cases white clover heavy, $8.00-8.50; few best guaranteed free from candying $9.00, light low as $6.50. Vermont, 20-section cartons white clover $7.00-7.75. Extracted: Sales to confectioners and bottlers, Porto Rico, amber 70-80c per gal.; California, white sage, few sales 16c per lb.

CHICAGO.—No straight carlot arrivals. Practically no f. o. b. buying, receipts being exclusively consignments and supplies reported as liberal. Market very dull. Practically no demand. Trading practically at standstill on all grades. What few sales are being made are in small lots. Dealers willing to sell at even lower figures in order to move stock on hand. Extracted: Sales to bottlers, Michigan and Colorado, per lb., clover and basswood white 9-9½c, light amber 7½-8½c. Comb: Sales direct to retailers, Michigan and Ohio, No. 1, 24-section cases $6.25; No. 2, poor condition, light, leaky or discolored sections $3.00-4.00. Beeswax: Receipts moderate. Market about steady. Trading fair. Sales to harnessmakers and wholesale druggists, Missouri, Colorado, and Oklahoma, per lb., best, light 31-33c, dark 26-27c.

CINCINNATI.—Since July 1, 1 car Utah, 3,500 lbs. Ky. and approximately 2,000 lbs. from Ohio arrived. On account of the refusal of the principal honey and beeswax receivers to furnish the information necessary to report market conditions and prices in Cincinnati accurately and completely, no report can be published for this important honey and beeswax center.

DENVER.—Market inactive. Trading light. Extracted: Sales to jobbers, per lb., Colorado, white 11-13½c, light amber 10½-12¾c, amber 10c. Comb: Colorado, 24-section cases No. 1, white old stock $5.40 per case, new stock $6.30.

MINNEAPOLIS.—No carlot arrivals. Extracted: Supplies light. Practically no demand. No sales reported.

KANSAS CITY.—No carlot arrivals since last report. Supplies light. Demand and movement light, market dull. Extracted: Sales to jobbers, Utah, extra-light amber, 11c per lb. Comb: Colorado, 24-section cases No. 1, white, $6.00-6.50.

NEW YORK.—Domestic l. c. l. receipts very light, South American and West Indian receipts light. Supplies light. Demand and movement slow, market dull, few sales. Extracted: Spot sales to jobbers, wholesalers, confectioners, bakers, and bottlers, domestic, per lb. California, white orange blossom and white sage mostly 11-12c; light amber sage 9-10c, few 11c; white sweet clover 9-11c, light amber alfalfa 7-8c. South American and West Indian, refined per gal. best 55-60c, poorer low as 50c. Beeswax: Foreign receipts light. Supplies limited. Demand and movement light, market dull. Spot sales to wholesalers, manufacturers, bakers, and drug trade, per lb. South American and West Indian, crude light best 25-27c, few 28c, poorer low as 23c, dark 14-16c, African, dark, mostly 14-15c.

PHILADELPHIA.—Receipts very light. Supplies, altho light, are sufficient to supply demand. Movement to bakers continues light but there seems to be a little better demand. Extracted: Sales to bakers, Porto Rico and San Domingo, in barrels, dark amber 65c, light amber 68c per gal.; in 60-lb. tins dark amber 8c, fancy light amber 9c per lb. Beeswax: Supplies are generally moderate, but with practically no demand. No sales reported.

ST. LOUIS.—Comb: No receipts reported. Supplies light. No demand or movement. No sales reported. Extracted: Very light receipts of southern honey in 5-gal. cans reported. Supplies, including old stock, liberal. Demand draggy and movement limited, market weak and prices only nominal. Few sales direct to retailers in small quantities in 5-gal. cans. Southern, various mixed flavors per lb. best light amber 9-10c, dark and inferior 6½-8c, mostly 7½-8c. Others, no sales reported. Beeswax: Receipts very light. Supplies light. Limited demand in small quantities but very little moving. Market is very quiet altho prices remain firm. Sales to jobbers, southern, ungraded average country run 25-26c per lb.

H. C. TAYLOR,
Chief of Bureau of Markets.

Special Foreign Quotations.

LIVERPOOL.—The market has been very much easier since our last report. There is a fair export demand for Chilian. The value of extracted honey at today's rate of exchange is 5 cents per lb. The value of beeswax in American currency is about 22 cents per lb. Taylor & Co.
Liverpool, England, July 6.

CUBA.—We quote extracted honey at 35 cents a gallon, and yellow wax at 20 cents a pound.
Matanzas, Cuba, July 12. Adolfo Marzol.

Opinions From Producers.

Early in July we sent to actual honey producers, scattered over the country, the following questions:

1. What has been the average yield per colony to date for your locality? Give answer in pounds. Comb honey? Extracted honey?
2. How does the total crop compare with normal in your locality? Give answer in per cent.
3. What price are producers asking for the new crop in large lots? Comb honey? Extracted honey?

It will be noted that the prices given by some of the reporters are for large lots, while others quote prices in small lots to the retail grocer.

		Yield			Price	
State.	Reported by	Comb.	Ext.	Crop.	Comb.	Ext.
Ala.	J. M. Cutts...	25	17	50	$.20	$.10
Ark.	J. Johnson....	12½	0	100	.30	
Ark.	J. V. Ormond..		20	50		.25
Cal.	L. L. Andrews.	1	10	12		.10
Cal.	C. W. Hartman		27	12		.09
Colo.	J. A. Green....	5	20	85		
Colo.	B. W. Hopper.		5	5	5.50	.10
Conn.	A. Latham....	30	50	150		
Conn.	A. W. Yates...	10	10	50	.35	.18
Fla.	H. Hewitt....		35	100		.12
Fla.	W. Lamkin....	40	80	100		.10
Ga.	J. J. Wilder...	30	50	70	5.00	.13
Ida.	J. E. Miller...				.15	.10
Ill.	C. F. Bender..	10		25	.30	
Ill.	A. L. Kildow..	10	15	15		
Ill.	A. C. Baxter..	25	60	40	.25	.20
Ind.	E. S. Miller...	35	50	90	6.50	.20
Ind.	Jay Smith....	35	60	100	.35	.20
Ind.	T. C. Johnson..	40	50	100		
Ia.	E. G. Brown..		50	50		.12
Ia.	W. S. Pangburn			5		.16
Kan.	C. D. Mize...	40	50	60		
Kan.	J. A. Nininger	10	30	80	7.00	.15
Ky.	P. C. Ward...		32	70		
Me.	O. B. Griffin...	20		40	.30	.25
Md.	S. J. Crocker.	15	20	25		
Mich.	L. S. Griggs...		75	75		.18
Mich.	I. D. Bartlett.		25	35	.36	.20
Mich.	B. F. Kindig..	60	90	100	.25	
Mich.	F. Markham...	75	100	100	.25	.15
Mich.	E. D. Towns'd		50	65		.15
Miss.	R. B. Willson..	20	45	100	.32	.16
Mo.	J. H. Fisbeck..			60		
Neb.	F. J. Harris..		10	10		
Nev.	T. V. Damon.			50		
Nev.	L. D. A. Prince				5.50	.12
N. H.	J. R. Hepler..	25	65		.40	.32
N. J.	E. G. Carr....		40			
N. Y.	O. J. Spohn...	40	60	60	.25	.17
N. Y.	Geo. Howe....		20	25		
N. Y.	G. H. Rea....	20	30	50		
N. Y.	F. W. Lesser..	30	50	66		
N. Y.	N. L. Stevens..		50	150		.12
N. C.	W. J. Martin..				6.00	.15
Ohio.	E. G. Baldwin.	30	60	100	.25	.15
Ohio.	F. Leininger..	70	100		.20	.15
Ohio.	R. D. Hyatt...	70	130	125		
Okla.	C. F. Stiles...	20		50		
Ore.	E. J. Ladd....	50	75	100	6.50	.15
Ore.	H. A. Scullen.		50			
Pa.	D. C. Gilham..	16	25	40		
Pa.	H. Beaver....	30	40		5.00	.15
R. I.	A. C. Miller...		20	100	.30	.30
S. D.	L. A. Syverud	50	75	100	5.00	.11
Tenn.	G. M. Bentley	60	70	100		
Tenn.	J. M. Buchanan	40	60	100	.30	.25
Tex.	J. N. Mayes...		70	75	.13	.10
Tex.	H. B. Parks...		50	100		.09
Tex.	T. A. Bowden.			75		
Utah.	M. A. Gill....			110	5.00	.10
Utah.	N. E. Miller...			100		
Vt.	J. E. Crane..	10		25		
Va.	L. N. Gravely.	5	8		.25	.15
Va.	T. C. Asher...	10	15	20		
Wash.	G. W. B. Saxton			166		.12
Wash.	W. L. Cox....	5	0	100		.13
W. Va.	T. K. Massey..	0	0	0		
W. Va.	W. C. Griffith.		100	300	.25	.15
Wis.	E. Hassinger..		50	60		.12
Wis.	H. F. Wilson..		37	62		.18
Wis.	N. E. France..		40	85		.15
Wis.	Gus Ditmer...	0	0			

QUALITY QUEENS

During August, September, and October we will have a surplus of guaranteed stock of Untested Queens at $1.00 each. Special prices on lots of fifty or over.

THE A. I. ROOT CO. OF TEXAS
Box 765, San Antonio, Texas.

ROOT'S BEE SUPPLIES

Carload stocks at Ohio's distributing center. Orders filled the day they come in. Save time and freight by ordering from

A. M. MOORE, Zanesville, Ohio
22½ S. Third Street.

MOTT'S NORTHERN-BRED ITALIAN QUEENS.

For July: Sel. Untested, $1.25 each; $15.00 per doz. Sel. guaranteed pure-mated or replace, $1.75 each; $18.00 per doz. Sel. Tested, $2.50. Filling orders by return mail now with the aid of my Southern branch. Plans "How to Increase" and "Introduce Queens," 25c.

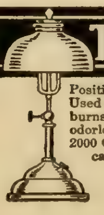
E E. MOTT, Glenwood, Mich.

COPPER CANS of Heavy Cold Rolled Copper with Screw Caps, Highest Grade Cans on the Market. Mail orders Shipped at once in Strong Wood Boxes. Money Back if Dissatisfied. Circular Free. Hydrometers $1.50.

SCREW CAP
10 GAL. $20.00
7 GAL. $15.00
5 GAL. $12.50
3 GAL. $10.00

COPPER TUBING per foot, ¼-inch, 20c; ⅜-in. 25c; ½-in. 35c; ¾-in. 60c; 1-in. 95c (lengths up to 30 ft.) Unions: ¼-in. 35c; ⅜-in. 50c; ½-in. 75c; ¾-in. $1.00; 1-in. $1.50.

STANDARD METAL WORKS
6 Beach St., Boston, Mass. *Dept.* 047.



The "BEST" LIGHT

Positively the cheapest and strongest light on earth. Used in every country on the globe. Makes and burns its own gas. Casts no shadows. Clean and odorless. Absolutely safe. Over 200 styles. 100 to 2000 Candle Power. Fully Guaranteed. Write for catalog. AGENTS WANTED EVERYWHERE.

THE BEST LIGHT CO.
306 E. 5th St., Canton, O.

Five-Pound and Ten-Pound Friction-Top Pails

We are naming prices below on these pails, and please note that **THESE PRICES ARE F. O. B. CARS LANSING**, and not from some distant factory point from which you will get slow delivery and high freight rates:

	25	50	100	200	500
5-lb. Friction-top pails	$2.25	$4.25	$ 8.00	$15.75	$38.00
10-lb. Friction-top pails	3.00	5.90	11.50	22.50	55.00

5-lb. Pails per wooden case of 12, per case $1.40; 10 cases $13.
10-lb. Pails per wooden case of 6, per case $1.10; 10 cases $10.

Comb Honey Shipping Cases

There is an increasing interest in the production of comb honey, and a material reduction in price on the shipping cases. You will get better prices for your honey if put up in these attractive packages. We quote on application.

We can make immediate delivery on seasonable items, such as sections, comb foundation, extractors, etc.

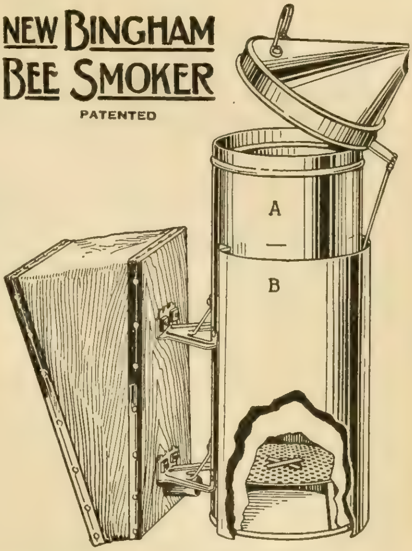
M. H. HUNT & SON

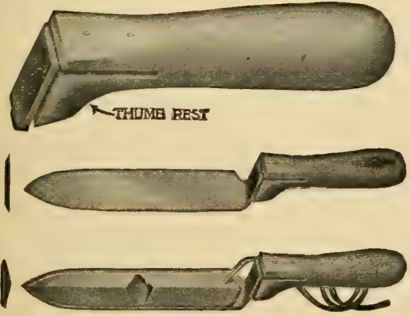
510 North Cedar Street, Lansing, Michigan

Buy Bingham Bee Smokers

On the market over 40 years. The bellows of best quality sheepskin is provided with a valve, which gives it pep and makes it respond quickly to the most delicate touch, giving as much or as little smoke as is required. The Big Smoke size, stove 4 x 10 inches, with asbestos-lined shield, permits the holding of the smoker between the knees without danger of burning the trousers or one's legs. This size is much appreciated by extensive operators.

Postage extra.	Size of stove, ins.	Shipping wt., lbs.
Big Smoke, with shield	4 x10	3
Big Smoke, no shield	4 x10	3
Smoke Engine	4 x7	2¼
Doctor	3½x7	2
Conqueror	3 x7	1¾
Little Wonder	3 x5½	1½





Buy Bingham Honey Uncapping Knives

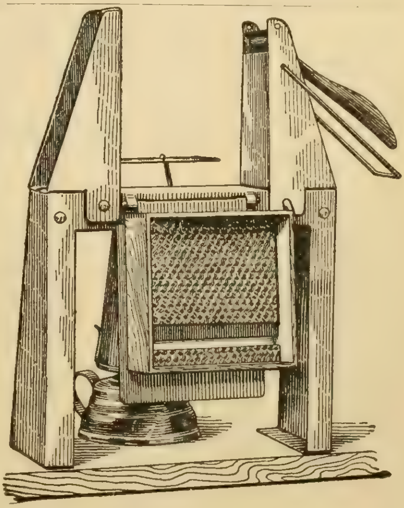
Made of the finest quality steel for the purpose that money can buy. These knives of the proper thickness and quality have given the best of satisfaction, as the old timers will testify. For over thirty years the men engaged in the manufacture of these knives have been at this work. The perfect grip cold handle is one of the improvements.

Buy Woodman Section Fixer

One of our men, with the Section Fixer, puts up 500 sections with top starters in one hour and thirty minutes, 500 sections set up with top starters in ninety minutes. This includes the labor of cutting foundation, getting sections and supers and placing the sections into the supers and carrying them away. A complete job. This is nothing unusual, but his regular speed. You can do the same if you have the push, after you become accustomed to the work. There is no breakage of sections. It will pay you to secure one of these machines for this work. It is the best thing of the kind on the market.

SPECIAL SALE HONEY PACKAGES.

Get our latest reduced prices on all honey packages. Let us add you to our large list of pleased customers on this line of merchandise. Special prices on shipments from factories direct to customer. Sixty-pound cans in bulk and in cases, Friction-top Pails and cans all sizes. Clear flint glass, Mason jars pints and quarts, tumblers, pound jars and other sizes. Get on to our list, so as to get quotations.



A. G. Woodman Co., Grand Rapids, Mich., U. S. A.

A Postcard to You

Did you get our postcard announcing lower prices? It was mailed to you early in the month of June.

32 per cent reduction on famous No. 1 Lewis section boxes.

30 per cent reduction on all hives, bodies, supers, and covers.

Many other low prices on items you may need now. These apply to No. 1 grade of goods only.

Also ask for bargain list on "Odd Lot" goods.

Italian Queen Bees

August is the season for requeening in most parts of the U. S. A., just at the end of the honey flows. Arrangements have been made with one of the best Southern queen-bee breeders to furnish 3-banded Italians to enable beekeepers to introduce better stock. Prompt shipment, safe arrival, and satisfaction guaranteed in U. S. A.

Price, $1.00 each, untested.
Price, $2.25 each, tested.

LOOK FOR THIS

BEE HIVES AND APIARIAN EQUIPMENT
BEWARE
WHERE YOU BUY YOUR
BEEWARE
WATERTOWN WIS. U S A
MAKES THE FINEST.
COPYRIGHT, 1916, BY G. B. LEWIS COMPANY

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Home Office & Works, Watertown, Wis., U.S.A.

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Distributers Throughout the U. S. A.
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GLEANINGS IN BEE CULTURE

AUGUST, 1921

Our Cover Picture.

OUR FRONT cover this month shows one of the apiaries of The A. I. Root Company near Medina, Ohio, as it appeared in July before any of the honey was taken off. The Root Company has near Medina a series of apiaries which are operated for extracted honey. The crop from these apiaries this season will probably be somewhere between one and a half and two carloads of honey.

Melezitose, a Rare Sugar in Honeydew.

A PECULIAR honeydew is sometimes gathered from scrub pine in considerable quantities, which contains the rare trisaccharide, melezitose. Minute quantities of this rare sugar have been available to scientists for many years, but never in larger quantities until it was discovered in honeydew in this country. It derives its name from melez, the French name for larch tree, on which it was originally discovered as honeydew. It also occurs as manna on a leguminous tree in Persia. Recently it has been found in the form of honeydew on the Douglass fir in British Columbia and from scrub pines in Pennsylvania and Maryland.

Honeydew which contains melezitose granulates almost as fast as it is stored in the combs, and sometimes the dry crystals can be seen in the bottom of the cells even when only a few drops of nectar have been deposited in them. Some manufacturing chemists desire to obtain honeydew which contains melezitose, and beekeepers who are located where it is gathered freely may be able to supply this demand, which is, of course, for limited amounts only. Just now we have a letter from the Digestive Ferments Co., Detroit, Mich., inquiring where such honeydew can be obtained. Beekeepers who have a supply of honeydew which granulates quickly could determine whether it contains melezitose by sending a sample to this firm.

What Has the Harvest Been?

OUR READERS will find a vast amount of information within a small space in the Opinions of Producers on our market pages. Southern California has had a very poor yield from orange and sage. while farther north in the State the yield is better. Taken as a whole the reports from California indicate that the crop in that State will be far below normal. It is too early to estimate the yield from alfalfa and sweet clover in the Intermountain region; but present indications are that the crop will be below normal in Colorado, Idaho, and Nevada, while farther north prospects apparently are better. Reports from the sweet clover belt of the Missouri River Valley indicate a good yield from this source. Reports from Texas are much more encouraging than earlier in the season, and some parts of this State at least will have a normal crop. In the white clover region the area of heaviest yield apparently is northern Ohio, eastern Indiana, southeastern Michigan, and Ontario, where the yield is well above 100 pounds per colony in well-managed apiaries. Outside of this area the yield from clover is spotted. Northern New York and Vermont report but little surplus. Central and western New York report yields from 20 to 50 pounds per colony. In Wisconsin, Illinois, and Iowa the yield is spotted, but generally somewhat below normal, except that western Iowa has a good crop in the sweet clover section. The Atlantic Coast States south of Pennsylvania have secured but little surplus honey except in some portions of Florida. Eastern Tennessee reports a good crop from clover.

Contributions to Doctor Miller Memorial to Continue.

ALTHO it was the plan of the committee in charge of the contributions for the Doctor Miller Memorial Fund to close the subscriptions in June, it has been decided to continue the effort until a larger amount has been collected. Some scattered contributions are still being re-ing received, and members of various beekeepers' associations have suggested that their associations may desire to contribute. ''The Bee World'' of England and the ''South African Bee Journal'' are asking their readers to contribute to this fund, and it will take some time for these contributions to be collected and sent to this country. Surely, if men in other parts of the world are eager to honor the memory of Doctor Miller, a greater number of the beekeepers of the United States than have already contributed will desire to do so if given more time. The committee has decided to continue its efforts to collect a fund large enough to provide a lasting memorial that shall be a fitting tribute to this great man, even if it takes many months to do it.

The following letter from Doctor Phillips expresses clearly the viewpoint of the committee in making this decision:

> Dear Mr. Root:
>
> I have your inquiry regarding the desirability of continuing the effort to obtain subscriptions for the Miller Memorial Fund. I am very much in favor of going right on with this until all beekeepers who wish to do so may have the opportunity to contribute. The amount so far obtained does not, I am sure, include contributions from all who have been benefited by the life and work of Doctor Miller, and it would be a pity to close this fund until all have had a chance to do their part. The various associations will doubtless take this up at their meetings, and more money will come in.
>
> When we consider what the work of Doctor Miller has meant to the beekeepers of the whole world, it is evident that there are many more who will feel it a duty and privilege to help. Those beekeepers who had had but who conquered European foul brood will realize that but for the work of Doctor Miller their returns from their bees would be many thousands of dollars less, and they will want to show their appreciation of his aid. Comb-honey producers who successfully control swarming in out-apiaries realize that without his aid they would necessarily be content with less colonies of bees, and they will wish to share the extra profits in honoring the man who, more than any one else, made their larger operations possible. Many other classes of beekeepers could be mentioned who have received financial benefit from his work; but there is the still larger class of beekeepers who are better, bigger men and women because of his life, and that is an obligation which we can not pay off in dollars. This calls for our best efforts.
>
> Under these circumstances, it seems to me that we should go on asking for funds, until we get an amount that will be a living, growing thing, which will for all time benefit beekeepers everywhere, for that was what Doctor Miller wanted to do more than anything else on earth. There is no hurry about closing this up, for the memory of Doctor Miller is not a transient thing, and beekeeping will last as long as there are flowers and bees, without which none of us would care to stay here. Let's keep at this until the fund can do for beekeeping what Doctor Miller would so much have liked to do. Very truly yours,
>
> Washington, D. C., June 28. E. F. Phillips.

Subscriptions may be sent to any member of the committee, as follows: C. P. Dadant, Hamilton, Ill.; B. F. Kindig, East Lansing, Mich.; E. G. LeSturgeon, San Antonio, Texas; Dr. E. F. Phillips, Bureau of Entomology, Washington, D. C.; E. R. Root, Medina, Ohio.

Preparations For Winter.

WHILE beekeepers are harvesting their crop of honey they are usually too busy to give much thought to a subject so remote as the preparation for next year's crop, yet the beginning of the foundation for the 1922 honey crop is made this month, whether the beekeeper directs it or not. With all that has been written on the subject of wintering, too little emphasis has been placed upon the history of the colony during late summer and fall, and much of the so-called winter loss should not be charged to the winter but rather to late summer and fall management. Really, the problem of wintering begins about the middle of August, for the condition of the colonies from that time until brood-rearing ceases determines largely how well they will winter.

Where brood-rearing ceases early in October, as it does thruout the greater portion of the North, the bees which form the winter cluster must be reared in August and September. When conditions are favorable the bees will rear plenty of young for winter without any attention on the part of the beekeeper; but if conditions are not favorable for a moderate amount of brood-rearing during any considerable part of the time after the middle of August, the bees may be in poor shape for winter.

Colonies that are queenless or that have old or failing queens during this period can not be expected to withstand the winter. While it may not be profitable for extensive honey producers to examine every colony to find a few that may be queenless, beekeepers are finding that systematic requeening in July and August pays well for the time it requires. In the North many beekeepers advocate replacing the queens after the second year, usually requeening half of the colonies each year. Farther south, where the seasons are longer, many find it profitable to requeen every year.

Midsummer requeening is especially profitable in those localities where there is a dearth of nectar during August and September, for a young queen that begins to lay this month will usually lay enough eggs, even during a dearth of nectar, to make a fair-sized winter colony if there is enough honey in the hive to feed the brood, while an old queen would practically cease egg-laying. In addition to this the young queen reared at this time is in prime condition for her heavy work next spring.

Colonies that run short of stores after the middle of August may be ruined by living on the verge of starvation for even a few weeks at the time the winter bees should be reared. Thousands of colonies have been lost during the winter and the loss counted as winter loss, because the beekeeper extracted all the honey from the supers, expecting the bees to get along with what was left in the brood-chamber. When this is done the bees are almost sure to run short of honey just when they should be rearing young bees to tide the colony thru the winter, unless there is a fall honey flow sufficient for their needs.

Some of our best beekeepers are now solving this problem by leaving from five to seven full-depth combs of honey in the last super when extracting, or providing each colony with a shallow extracting super filled with honey. Of course, where there is a fall honey flow, this is not necessary; but, unless the fall flow is assured, the leaving of plenty of honey now is a good form of insurance.

Now that the problem of marketing honey is a serious one, the beekeeper may well become one of his own customers and use a portion of the honey, which he could have extracted, to help insure the prosperity of his colonies for next year.

* * *

Selling Honey Locally.

UNDER the present conditions of the honey market it behooves every beekeeper to sell every pound of honey locally that is possible. Every pound that can be sold in this way relieves the wholesale market just that much, and in most cases that which is sold locally goes to consumers who could not be reached thru the ordinary channels of trade, thus to a large extent opening up a new outlet for honey.

During the past few years, when the demand for honey was heavy, much honey was diverted from the local market to the wholesale market. It was so much easier to ship the entire crop to a dealer at a good price (in many cases more than could be obtained locally) than to sell it in small lots near home that producers could not afford to supply the local trade. This has all been changed within a year, and many beekeepers are now selling their honey to farmers and others in their locality, some extensive producers being able in this way to dispose of their entire crop. For this class of trade the five and ten pound pails are being used more and more.

Those who are located on much traveled automobile routes can sell large quantities of honey at the roadside to passing motorists by putting up an attractive sign where the driver cannot fail to see it. Many beekeepers sell thousands of pounds in this way every season. Many of those who buy honey in this way do not know that pure honey can be purchased in the city. In fact, most of them probably have never given the subject of honey a thought before seeing the honey sign at the roadside. The idea of new honey fresh from the country appeals to many city folks when it is brought to their attention in this way, and a new customer as well as a new booster for honey is thus made, provided the beekeeper is wise enough to offer for sale only the very best quality of well-ripened honey.

While it is not necessary that the apiary be in sight, to sell honey at the roadside, it is well to have at least a few colonies of bees to help attract the attention of the motorist. People like to buy honey from someone who has bees, and if the honey sign at the roadside can be so located that the approaching motorist is led to glance from the sign to the beehives, the combination should have the desired effect if the driver is at all fond of honey.

Another aid to the selling of honey locally is advertising in the local paper. This may be only a line or two, or it can be made a half-page honey advertisement, as the honey producer chooses. The small advertisement will help much, and the large advertisement will help more. Whatever the size of the advertisement, emphasize the food value and deliciousness of honey and the fact that it is a safer and better sweet than any other. Also tell just how it can be ordered and delivered.

The beekeeper who is not a salesman may find a neighboring beekeeper who is a good salesman and who can dispose of more honey than he produces. By turning over his crop for the other man to sell, Mr. Poor Salesman will be helping himself as well as the man who sells it for him.

In every case where honey is sold locally, the beekeeper should demand a price sufficient to pay him well for the trouble of selling. He should remember that in selling his product direct to the consumer he is rendering a service which is worth money and he should secure pay for it.

It often happens that a beekeeper sells all the honey to a local dealer that he can induce him to take, then afterwards peddles out the remainder of his crop to this dealer's customers at the same price he received from the dealer. Such a procedure is not only unfair, but it is poor business. When all the costs of selling are counted, as they should be, the beekeeper will no doubt find that it costs him more to sell honey than it does the dealer. If this cost is not added to the price of the honey, the producer loses this amount which is rightfully his. If this represented all the loss it would not be so bad, but the producer who does this, by shutting off the trade of his local dealer, is closing one of the channels thru which he expects to market a part of his honey in the future.

Just what price the beekeeper should ask for his honey when selling locally at retail will depend upon circumstances, but in any case it should not be materially less than the local dealer is asking. Gleanings is gathering all of the data obtainable as to crop and market conditions thruout the country. This information is published on our market pages, and every beekeeper who has honey to sell should study these pages carefully. Generally speaking, the retail price is more than double that of the price in 60-pound cans when the crop is sold in one lot. At first this may seem like too much difference, but when the cost of the packages, the expenses connected with selling, and the time of the salesman are counted the costs mount rapidly.

To a few beekeepers, selling honey locally at retail is a disagreeable task which they will avoid if possible, but under present conditions something must be done to induce people to eat more honey, if the beekeeping industry is to thrive. If thousands of beekeepers will take part in a drive of this kind now, beekeeping should be able to tide over these trying times and be in better condition to supply the demand for honey when normal times return.

STATE FAIR EXHIBITS

The Dawning of a New Era in Honey Exhibits. The Michigan Plan

By E. B. Tyrrell

[Instead of a number of small competitive exhibits of honey scattered here and there among exhibits of other products, let us suppose a state beekeepers' association putting up one large exhibit on the co-operative plan, the honey being uniform in quality (all the very best), and packed in uniform packages, each bearing the association label. Suppose further that the honey is sold on the grounds, the beekeepers who own it being sent a check at the close of the fair instead of having the honey returned to them, thus insuring a liberal supply for an exhibit which does justice to the industry. Suppose, again, that experts in the art of arranging attractive displays have charge of the honey exhibit and that these experts are furnished an entire building in which to display the honey, the exhibit being arranged in such a manner that visitors as they enter the building are overwhelmed with the magnitude of the display, which is a single large unit instead of many small units, leaving the impression of acres of honey. What would be the advertising value of such an exhibit? In this article Mr. Tyrell tells us what Michigan is doing along these lines. Ohio has already adopted the Michigan plan, and no doubt, other States will try a similar plan this year.—Editor.]

"I CAME after a 10-pound pail of honey," she said. "Sorry, but we haven't a pail left," was the reply. "You don't mean to say you have sold all that honey you had here at the beginning of the Fair," she said. "Yes, the last pail went Friday night."

She couldn't believe it. She was in the first day or two of the Fair and saw 10,000 pounds of honey piled up in glass and tin. She was sure there was enough in that pile to supply all Detroit. She thought she had plenty of time to buy all the honey she wanted before the Fair was over. She was not alone in her disappointment. Many were the requests for honey the last few days of the 1921 Michigan State Fair that had to be refused. And this opens up an interesting story of fair exhibits.

A New Judge.

In the spring of 1907, a carload of bees and hives arrived at Caro, Mich.; that is, the car contained nothing but the 50 hives of bees and their equipment. As that kind of freight was not arriving regularly, it was the occasion of a write-up in the local press. The bees and equipment belonged to the writer.

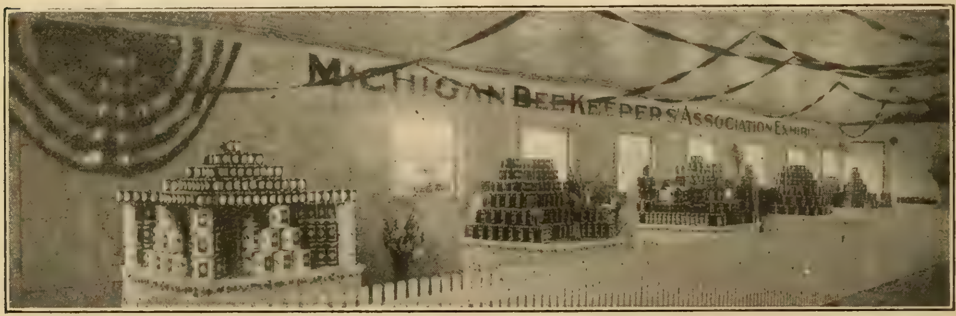
The year previous there was dissatisfaction on the part of the largest exhibitor at the Michigan State Fair in regard to the judging. The superintendent of the bee and honey department knew nothing about bees. He also lived in Caro. When he read that newspaper item he interviewed the writer, with the result that the bee and honey exhibit, the next year at the State Fair, had a new judge.

For five years I continued judging. I used the comparison method—a method, I afterwards learned, which seems to be a standard method used by the best judges in England. I did not try to determine points. So far as I know, my judging satisfied the exhibitors. Then I was appointed assistant superintendent of the bee and honey department, and served as such for four years, or until 1916, and since that time I have been superintendent.

System Was Wrong.

But there was something wrong with our system. We couldn't get the exhibitors. We wrote letters. We pleaded at conventions. At the suggestion of the beekeepers, we increased the premiums. It was no use. Only two or three exhibitors would show up, and one year only one. The beekeepers said it cost too much to take honey to the Fair, and it didn't pay; or they had too much work to do at that time. It got to the point where the fair management threatened to throw the whole bee department out.

It was at that time that I proposed a mutual exhibit. I recommended cutting out the premium list entirely and making an appropriation to equal the premiums offered—



Co-operative honey exhibit at the Michigan State Fair, 1919. The amount of honey was doubled in 1920.

this appropriation to be used to pay the expenses of getting up the exhibit. Secretary George W. Dickinson of the Fair told me to go to it, and if the beekeepers didn't respond we might as well discontinue the department. But the beekeepers did respond.

Supt. E. B. Tyrrell examining the first week's work of an Italian swarm which he caught in Detroit this year, and transferred to the Fair Grounds for next fall's exhibit. This swarm had aready built some comb in the tree when taken.

They were a little timid at first, as it was an untried experiment. The plan was for the State Fair to select and purchase certain glass and tin packages and labels and buy them. These packages and labels would be sent to the beekeepers who would agree to put up the honey as directed and ship it to the fair. At the close of the fair, the honey was to be sold at wholesale, and the beekeepers would receive a good wholesale price for their honey, instead of having the honey sent back. The first year, each exhibitor's honey bore his number on the label. Then a printed list of all exhibitors, with their corresponding numbers, was furnished those visiting the exhibit. In that way, each purchaser of honey would be able, by referring to the list, to know who produced it. Hundreds of these lists were given away.

Trying to Push Michigan Honey.

But this plan was not the best because we could not always make an equal distribution of the exhibitors' honey. And it centered the buyer's attention on one exhibitor. What we were trying to do was to push Michigan honey, and not any one producer. We wanted them to think that all honey on exhibition at the Fair was good, and that all exhibitors were worthy of equal confidence. So the second year, the list was printed without the numbers. No one could tell which exhibitor produced the honey he bought. And it was almost impossible for the ones in charge to tell either. The printed list was distributed again the second year, with no numbers. Several thousands of these were used. The same thing was done the third or last year.

Ten Thousand Pounds of Honey Exhibited.

In 1918, the first year the mutual exhibit was tried, there was about 2,500 pounds of honey on display. Much of it was sold during the fair at retail, but there was quite a lot left at the close to sell at wholesale. In 1919 the amount of honey was increased to 5,000 pounds, and only a very little was left at the close of the Fair to sell at wholesale. In fact, orders were received during the Fair for all there was left, to be delivered at the close of the Fair. The 1920 exhibit had 10,000 pounds of honey, and every pound was sold and taken away during the Fair, with many calls for more that could not be supplied.

The first year, the beekeepers sent in the honey and were paid what it brought at the close of the Fair. We tried to get many to send. The plan was expensive, as the express rates were high. Both packages to the beekeepers and honey to the Fair were sent by express. Some exhibitors did not pack properly and there was loss by break-

Secretary-Manager Michigan State Fair, G. W. Dickinson, getting acquainted with bees to be used in this year's exhibit.

age. The Fair stood all such losses, however. The second year was better, as packing instructions were followed, resulting in less breakage.

Last year the Fair bought the honey outright from the beekeeper, at a price previously agreed on. Quotations were asked for from all interested and the honey was bought at the price quoted. It could have been bought cheaper; but we wanted the exhibitor satisfied, and we wanted the best he had. No one was prevented from sending honey, however, for which he would be paid, and his name would be printed in the list that was given out during the Fair. As stated there were 10,000 pounds of honey on display, all arranged along one side of the building. An entire building has been used each year for the mutual display, while before we had only a part of the building. On the opposite side were four colonies of bees in glass hives, connected with the outdoors by two-inch gas pipes, the bees working thru these during the Fair. They put up a much better appearance when so connected, because they were natural and were not running around in the hives. These hives were all glass, there being no wood or metal corners to obstruct the view.

Handling Live Bees.

In addition to these four hives, was one other colony in a regular ten-frame hive, in a large screen enclosure. At a certain time each day this hive was opened, the frames covered with bees were taken out, and a brief lecture on the production of honey was given. No attempt was made to make this demonstration spectacular. In fact, the opposite was tried. It was only to show the everyday workings of the beekeeper. Two exhibitors of bee supplies were there showing a full line. Both, I believe, have arranged to be present again this year, with, in one case at least, doubled space. Their displays were certainly a gathering place for beekeepers and others.

The Michigan Agricultural College has been represented at each of the three mutual exhibits. Last year samples of honey from different sources, honey vinegar, samples of foul brood, and many placards telling about bees and honey were shown. A representative was in charge during the Fair, and he was kept busy explaining and answering questions.

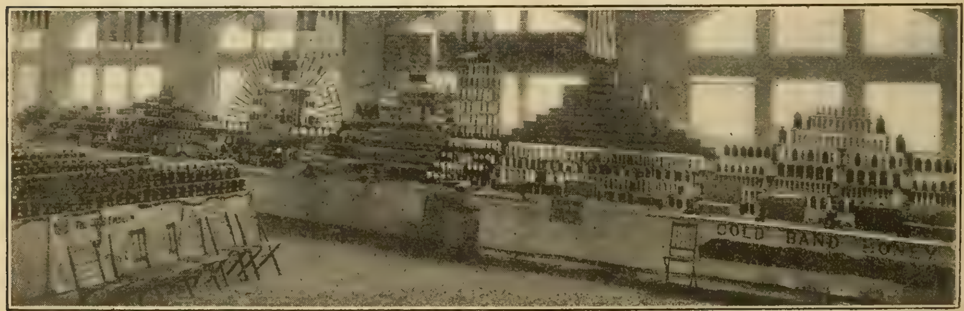
A Commercial and Educational Exhibit.

Summed up, the exhibit as now conducted is far ahead of the old competitive plan. There is no question now as to whether there will be an exhibit. Before we never knew until the Fair started what we would have. Then it was a mixture of each individual's ideas. Today it is uniform. Every pound glass jar looks like every other pound glass jar. The labels are all alike. Last year five packages were used: the 5-ounce jelly, the 8-ounce glass jar, the 1-pound glass jar, the 5-pound tin pail, and the 10-pound tin pail. Labels read, "Prize Honey, put up for the 1920 Michigan State Fair by members of the Michigan State Beekeepers' Association." There was no address. Of course, the weight was also put on.

This year, the same general plan will be used. The honey will be bought outright. The State Fair will furnish the packages and labels. They will be shipped to the beekeepers for filling. About the same quantity will be secured. The Fair will own its own bees, however, as it now has four colonies on the grounds working. The honey will be sold at retail, as hundreds of people are now depending on the State Fair for their supply of honey. It advertises Michigan honey, and gets people eating honey who would not otherwise do so. And remember that we are pushing the large package—the 5 and 10 lb. pail. We can put up any-sized display we want on the present plan, and, last but not least, we can plan the display in advance.

I am frank to say that these results could not have been accomplished without the splendid co-operation given the beekeepers by the secretary and manager of the Michigan State Fair, George W. Dickinson. You will have a hard time making a good bee department unless the manager of the fair is with you.

Detroit, Mich.



Honey display at the Wichita Wheat Show, Wichita, Kansas. Note the appearance of large quantities of honey.

PROTECTION OF NECTAR

Some of the Adaptations which Protect Nectar and Pollen from Moisture and Theft

By Prof. K. M. Wiegand

THE flower as an organ of the plant has to do with the production of seed, in which process, as is well known, cross-pollination is essential. In fact, many of the most important features of the flower, such as the showy corolla, scent, and nectar, are provided for the distinct purpose of making more certain this transfer of pollen from the anther of the plant where it is produced to the pistil of another plant in the ovary of which young seeds (ovules) are to be "fertilized." Plants, like thrifty human beings, practice a rigid economy in their living conditions. To produce more nectar and pollen than is actually necessary, or to allow these to be injured or stolen, would be inefficient and wasteful. To allow the nectar to be washed away by rain, or carried off by insect visitors that would not be effective in securing cross-pollination, would be poor business. We find plants adopting all sorts of means to obviate these dangers, and these contrivances are among the most interesting facts connected with the always interesting subject of floral biology.

Why Pollen Must Be Protected from Moisture.

The pollen of most plants is more or less injured by rain or dew. The pollen grains normally develop tubes in the fluid secreted on the stigma of the flower, and these tubes grow down thru the tissue of the style to the ovules below, but in pure water they swell up and for the most part eventually burst. For this reason the botanist who wishes to germinate the pollen in the laboratory artificially must plant his pollen not in pure water, but in a sugar solution approximating in strength the stigmatic fluid. Consequently we find various methods employed by the plant to protect the pollen from the wet. In most cases the same means employed to protect the pollen is equally efficient in protecting the nectar. These methods have been studied by the Austrian bottanist Kerner, who has noted a number of ways in which this is accomplished.

Protection by Hanging Position.

Some plants have bell-shaped, urn-shaped, cup-shaped, or tubular flowers which are pendent on curved stalks. The rain falls on the outside of such a flower without wetting the stamens which are within. A few flowers of this type are the blueberries, bluebells, foxglove, lily of the valley, and basswood, but there are many others. Such flowers are always open for the visits of insects while at the same time they are always protected from sudden showers. A modification of this type is where the whole flower cluster is pendent as in the black cherry and chokecherry. A more distinct modification of the same method is found in those cases where the flowers assume a pendent position only in wet weather or at night when the dew is liable to be heavy. This change in position of the flowers is effected either by a curvature of the pedicel of the flower or by a general drop of the whole flower cluster or in some cases by a nodding curvature of the whole top of the plant. Anemones, herb robert, chickweed, potato, English daisy, sow thistle, coltsfoot, buttercups, certain bluebells, and a great many other plants show this movement in rainy weather or at nightfall.

The nectar is protected from rain in the basswood by the hanging position of the flowers.

Another common and efficient method of protection lies in the ability of some flowers to close in rainy weather or at night. In the case of simple flowers it is the corolla or perianth which closes, as in the crocus, tulip, peony, rose, jimson weed, water-lily anemone, California poppy, and other species. The California poppy is especially interesting because, instead of the whole flower closing, each of the four petals forms a little tent over the pollen and nectar at its base, while the stamens, which have shed their pollen into the base of the flower remain exposed. In other so-called compound flowers, such as some members of the sunflower, of which the New England aster, dandelion, salsify, and devil's paint brush may be mentioned, the set of ray flowers close together so that the flower appears to be yet in bud.

Another rather common method by which the pollen is protected, altho not the nectar, lies in the so-called hygroscopic nature of the anther walls in many plants. On the approach of wet weather the anthers, which have opened to allow the escape of pollen, close up again. This condition can be seen only on close inspection, and there are probably more cases of the sort than are now known. In such plants usually no other means of protecting the pollen is present, and this substance at first appears to be wholly unguarded. The pollen of plantains, meadow rue, grape, tulip tree, and many other plants is thus protected, and this is probably the most common method of protection in the wind-pollinated catkin-bearing trees.

Protection by Special Contrivances.

Another way by which both pollen and nectar are protected is found in flowers of the so-called salver-form type with narrow tube and spreading border. The opening to the tube is often smaller than the tube itself, and the surface of the corolla is not wetted by the drops of rain which roll over the surface of the corolla. Because of surface tension these drops can not enter the narrow orifice of the tube without pressure being brought to bear to distort the drop and force it thru the opening. The nectar and honey inside the tube are thus efficiently protected from the wet. Among flowers of this sort are the phlox, forget-me-not, primrose, and many pinks.

The dandelion protects its nectar at night and during rainy weather by closing its flowers.

Other more special contrivances may be noted as in the touch-me-not or jewel-weed and other plants where the flowers are hung underneath the leaves which shed the raindrops unwetted; in the jack-in-the-pulpit and skunk cabbage in which the arching spathe incloses and roofs over the cluster of flowers; in the iris where the stigmas form a roof over the anthers; and in the sunflower family where the pollen is inclosed at first in the anther tube. The ornamental plant Cobaea and some other plants possess difficultly wetted pollen grains with a honeycomb-like surface, the pits of which contain sufficient air to retard greatly the wetting of the grain. A more common method of protection is found in the plants with pea-like flowers such as peas, beans, clovers, alfalfa, and the like, and in snapdragons and bleeding-hearts where the stamens are entirely inclosed until the moment when the transfer of pollen takes place.

Protection from Undesirable Guests.

If there is to be economy of pollen and nectar, means must be taken to prevent insects which would not normally effect pollination from carrying away these substances. The methods employed to accomplish this are very numerous and interesting. Peculiar folds, cushions, walls, gratings, brushes, and thickets of hair guard the entrance of the flower and render access difficult to all but the desired guest. Large and powerful insects can brush these obstacles aside, but small insects find this impossible and must climb over or circumvent the obstacles. In many cases this enforced divergence by small insects is sufficient, as they are unconsciously led past the anthers and stigmas. Many plants produce nectar in glands outside the flower; and, altho not entirely proved, it is supposed that this is for the purpose of turning unbidden insects from the flowers. Ants especially are attracted to these nectaries and have been seen to fight viciously other insects in the vicinity. This by some has been looked upon as a protection to the plant. The stems of many plants are covered with sticky hairs which render difficult, or prevent entirely, the passage of creeping insects up the stem. In a species of catchfly each internode of the stem is encircled by a band of sticky material, suggesting the sticky band about the tree trunk employed in Massachusetts to prevent the gypsy-moth larvae from climbing into the tree tops. Some people think that the water contained in the leaf bases and entirely surrounding each internode in the common teasel, thru its action as a moat, is to prevent small and undesirable insects from climbing the stem. The granular waxy covering or bloom on the pedicels and calyxes of flowers has been looked upon as a protection, since creeping insects find difficulty in walking on such surfaces and may lose their footing and fall to the ground. Stiff spiny hairs about the flowers are apparently an efficient protection against soft-bodied insects and animals such as snails. The contrivances to exclude the winged insects are situated mainly within the flower. These consist of irregular tufts and plugs of wool or latticework or crowns of various sorts. In some blueberries a latticework of barbs from the anthers protect the nectar but not the pollen. In many flowers of the phlox and nightshade families wool at the base of the style protects the nectary. In the tulip the nectary is protected by hair. The opening of many flowers with a narrow tube is closed by scales or palisades of hairs. Many flowers have corolla tubes so long that only butterflies and moths can reach the nectar. This is true of many honeysuckles, the jimson weed, and others. Most closed flowers, as the snapdragon, can be entered only by such insects as are desired. Small insects are not powerful enough to push their way in, or heavy enough to depress the lip. In the flowers of various members of the pea family, such as peas, beans, clovers, etc., the stamens are inclosed in the keel, which under the weight of sufficiently heavy insects is depressed, thus exposing the pollen. Small insects, however, can not usually effect this depression. The closing of diurnal flowers at night and nocturnal flowers by day is a protection against unbidden guests, as well as against rain and dew.

Only the general methods of protection and a few of the special contrivances are described in this article. Each plant has its own relation to these problems, either seeming to bid them defiance or exhibiting some peculiar and beautiful adaptation which renders the study of the problem peculiarly fascinating. Even these plants which seem defiant usually have their own reason for this apparent immunity.

Ithaca, N. Y.

NECTAR SECRETION

Some Observations on the Relation Between Temperature and Nectar-secretion in Greenhouses

By E. G. Baldwin

THE poet Horace said, "Even if you drive out Nature with a fork, she will come back." When greenhouse men first put glass over their cucumber vines they discovered that, tho they kept out the wintry blasts and the consequent low temperatures, they had at the same time and by the same means shut out the vitalizing agencies for pollination that Dame Nature had set to guard the perpetuation of the plant race.

So growers of early vegetables under glass soon learned to set hives of honeybees under the glass, along with the vines, thus doing away with the tedious and costly hand-pollination. That was one step back to nature again, to be sure; but, altho helpful to the young pickles, it proved very destructive to the bees. Inasmuch as it is vital to the greenhouse owner, that his vines be freely visited by the flying bees, it will at once readily appear, that it may not be sufficient merely to have bees in greenhouses, but to have bees visiting the flowers of the cucumbers while the blossoms are open. Therefore it is very important to determine the conditions most conducive to the flight of the bees while they are under glass, and the best means of getting full efficiency from them. It is a question of dollars and cents. It seems to be one also of dollars and sense! For it is an axiom with cucumber growers in greenhouses that "Cukes from little pickles grow; and no bees, no pickles setting." In a subsequent article we shall try to show some of the difficulties experienced in getting fullest efficiency from the bees under glass in the spring of 1920. The present interest centers in some observations made during the latter part of March of the year named, regarding the relation of temperatures to nectar-secretion.

All the temperatures here recorded were taken at hive level in the greenhouses, that is, about two feet from the ground. They were taken by the best tested thermometers, the night records being taken from Bristol's recording thermometers. The notes were made daily, often twice daily. It was the aim to mark the minimum temperature of the preceding night, the actual temperature at the time of observation, the rapidity of the rise or fall in temperature, the amount and kind of nectar in the nectaries of the blossoms, and the amount of sunshine then and during the time just preceding the observations. The nectaries of the blossoms examined were pulled apart, and the fleshy nectaries exposed at the base of the anthers, in the bottom of the flower-cup where the petals join the calyx. By means of a double hand-lens it was easy to note the presence or absence of nectar. While the method of thus examining the nectaries was not mathematically exact, it is believed that the eye could detect whether the nectar was more or less abundant at the time of the examinations, and whether it was dried down into crystals, sugary and white, or still liquid and oozing out of the nectaries; for the nectar in the cucumber blossom, under right conditions, is sufficiently abundant and copious to allow one to discern between dried-down sugar crystals or freshly exuding nectar; also the relative abundance of the latter. Bee-activity about or on blossoms also afforded a criterion on nectar secretion.

The observations were begun March 10, 1920, and ended March 31 of the same year. Some were taken in greenhouses with high roofs, and others in the ranges where roofs were exceedingly low; sometimes the vines were low and the aisles open; in other houses and at other times the vines were thick and heavy, making narrow and intercepted aisles of tendrils and vines.

Notes on Temperatures, Amount of Nectar, and Activity of Bees.

March 10.—Plant A.—8:30 a. m., temp. 72°F. Minimum on night previous 60°F. Bees just set in and not flying very well. Plants small and nectar not abundant. Bees worked better in Plant X in the afternoon than in the forenoon.

March 11.—11:30 a. m. Temp. 80°F. Partly cloudy. Bees flying a little, but not visiting blossoms. Bees just set in the greenhouse. No recording thermometer here. But the owner of this plant keeps a higher night temperature.

March 13.—5:00 p. m. Temp. 60°F. Cloudy almost all day. Nectar dried down to mere crystals. Bees working slightly.

March 14.—10:00 a. m. Temp. 79°F. Sun bright. Minimum preceding night at 7 p. m. 58°F. Nectar easily visible in blossoms on the nectaries, and in liquid condition. By 11:00 a. m. temperature had reached 82 and bees were still working, but the number of flying bees had decreased.

March 15.—Plant A, Range 3.—8:00 a. m. Temp. 68°F. Minimum preceding night at 7:30 p. m. 62°F. Only dried crystals of nectar in blossoms examined. Bees flitting from flower to flower freely, but not stopping to enter the blossoms; searching rather than getting. Partly cloudy. Plant A, Range 4.—8:15 a. m. Temp. 73°F. Nectar just beginning to exude in nectaries. Bees flying only slightly, but there are no normal colonies in the house. Plant X.—8:45 a. m. Temp. 72°F. Minimum preceding night 60°F. Nectar in crystals and just showing liquid. Bees working freely, and dipping into almost every blossom but not lingering long on any one. Noted, that after inserting tongue into one or two blossoms the bees halt a moment on the side of the flower and seem to wipe off their tongues on their legs or over their heads, as if to scrape off adhering substances; the nectar seems too thick and sugary. R. W. G. New Plant.—10:30 a. m. Temp. 80°F. Nectar exuding freely. Bees working fairly well. R. W. G. Old Plant.—10:45 a. m. Temp. 80°. Nectar seeming to be just starting in blossoms, bees working slowly.

March 16.—8:15 a. m. Temp. 74°F. Plant A, Range 3. Minimum preceding night, 1:30 a. m. was 61°F. Temp. rising rapidly. Nectar exuding rapidly in nectaries. Partly cloudy. Bees working well. Plant X.—8:30 a. m. Temp. 72°F. Minimum preceding night 60°F. Partly cloudy. Bees flying and gathering nectar freely.

March 17.—Plant X.—9:30 a. m. Cloudy. Temp. 81°F. Minimum preceding night 59½°F. Chart showed rapid rise in temperature from 60° to 81°. Nectar very abundant in nectaries and bees just beginning to fly. Remain long on individual blossoms. (Note: The cloudy morning seems to have held bees back, even tho the nectar is exuding freely; or the rapid rise in temperature may have made the nectar more copious; at any rate, the bees tarry longer than usual over the blossoms.) Plant A, Range 4.—11:00 a. m. Temp. 78½°F. Minimum preceding night 2:30 p. m. was 61°F. Bees working well. Partly cloudy. 11:30 a. m. temperature has dropped to 71°F. Nectar not very abundant and bees flying very little. Plant A, Range 3 —9:00 a. m. Temp. 73°. Nectar abundant. Minimum preceding night 61°F. Bees working freely. 2:30 p. m. drop of 2° to 71. Bees still working and nectar still abundant in nectaries.

March 18.—Plant A, Range 3.—8:30 a. m. Temp. 71°F. Minimum preceding night was 62° at 3:00 a. m. Bees beginning to fly freely. Sunshine. R. W. G. Old Plant.—Low-roofed houses. Vines thick. Aisles narrow. Temp. 84°F. Ventilators not opened yet Bees dropping to ground or clustering on rafters and roofs, seemingly confused and lost.

March 18.—Plant A, Range 4.—Temp. 2:30 p. m. 90°F. at hive level. Bees dropping to ground in clusters from the glass roofs. Ventilators still closed for some reason.

March 19.—Plant A, Range 3.—8:30 a. m. Temp. 69°F. Minimum preceding night 62°F. Raining hard outside. Nectar just beginning to exude in nectaries. Bees working fairly well but not tarrying long on blossoms. Plant A, Range 4. —8:15 a. m. Temp. 66°F. Minimum preceding night 62°F. Raining hard. Nectar mostly crystals, very little in liquid form. Bees hardly flying at all. (Note.—Plant A, Range 3.—Last night the manager of this plant fumigated his ranges with Nicofume, an insecticide, for thrips on his cucumber vines. Entrances of hives were not closed nor contracted. Bees do not seem any the worse for the fumigating.)

March 21.—Plant A, Range 4.—1:00 p. m. Temp. 94°F. Sun bright, and weather fine outside. Minimum preceding night 64°F. Ventilators opened and temperature dropped to 76° by 3:30 p. m. Bees worked fairly well all day, better early in day and late in the afternoon, when temperatures were between 70 and 80°.

March 22.—Plant A, Range 3.—8:30 a. m. Temp. 70°F. Minimum preceding night 60°F. Warm and sunny outside. Nectar showing in tiny drops in nectaries and bees working well. Worked well till 5:30 p. m. Ventilators opened soon after temperature got to 82°F. and closed when outside temperature dropped enough to keep house temperature at 80°F.

March 23.—Weather balmy and spring-like outside. Bees outside working on soft maples and flying freely. Ventilators open much of day, and bees passing out and in thru them.

March 25.—Fine weather. Soft maples and pussy willows all in bloom. Ventilators opened much of day. Bees working well, partly on outside and partly within greenhouses.

March 31.—Elms in bloom. Bees flying and working outside and in. Notes ended.

Altho these observations are fragmentary and imperfect, it seems to me that there were three recognizable factors at work in influencing the nectar secretion, namely, minimum temperature the preceding night, actual temperature at time of examination, and rapidity of rise of temperature from minimum to normal. Besides there were some factors that were not noted or recognizable at the time.

Sunshine seemed to have some effect; but it was impossible to determine whether it was the more rapid rise in temperature induced by the sun on the glass—a thing that always happened—or the actual rays in inducing better secretion. It was pretty clear from the notes made that bees did actually work better when sun shone; but it may have been partly the brightness which induces bees from the hives, whether they are outside or in. The observations seemed to indicate that the nectar in the blossoms was usually more copious when the sun shone or had been shining a little while; but that long-continued, all-day sunshine sent the temperature too high for the best secretion of nectar, or dried it up often before noon. Humidity may play a part, but no data on that were collected. All the soils were fertilized much alike for the cucumbers; and tho some soil tests were available for some houses, none were at hand for the others, and so no data were attempted on that line.

Some Conclusions.

In the main the data gathered seemed fairly consistent and suggested the following deductions:

(1) A rise in temperature from a minimum to a maximum brings the nectar over into the nectaries. Owing to the night and day temperatures best for growing cucumbers, the rise was daily, and usually occurred, under normal conditions, between 7:30 a. m. and 9:00 a. m. (The cucumbers require about 60° at night and about 80° during the day.)

(2) The minimum should not be higher than 60° nor the maximum higher than 80° for the best results in nectar secretion.

(3) There is some evidence to indicate that a lower minimum than 60° is even better.

(4) A higher minimum than 62° seems decidedly adverse to nectar secretion.

(5) A higher temperature, or a longer period of a given temperature seems necessary to bring across nectar freely on cloudy days than when the sun shines; that is, bees will not work as freely, and the nectaries do not show as much fresh nectar in as short a time when the weather is cloudy as when the sun shines. In short, it seems to take longer ''to get things going'' in cloudy weather, even tho the artificial temperature is normal, or identical.

(6) A rapid rise from minimum to maximum brings better secretion. Not only then does the nectar come more copiously, but also earlier in the morning. As the average temperature in greenhouses rises from about 61° at 6:00 a. m. to about 72° at 8:00 a. m., and then is raised to about 80° by 9:00 or 10:00 a. m., it was easy to observe the time and the hour, with corresponding effects on the time of the bees getting out to work. Seldom did they start before 7:30 a. m., and usually not till 8:00 or 8:30 a. m. Bees normally fly out for nectar at a temperature of 65°. It was a matter of wonder to me that, tho the temperature of about 61° of the night preceding in the greenhouses was only about four degrees below the flying temperature of 65°, seldom did the bees fly out before 8 o'clock in the morning. Was it the fact that only sugary crystals of dried-down nectar were in the blossoms to entice them, and that they came out only when liquid exudation set in? It surely seemed so.

(7) On cloudy days, when bees work at all normally, they seemed to spread their gathering time over a longer portion of the day. It may be that the temperature on cloudy days did not so soon pass the optimum for nectar secretion.

(8) But little nectar exudes in nectaries of cucumbers at temperatures below 70°F.

(9) The optimum for nectar secretion, and hence for flying of bees, seems to lie somewhere between 70° and 80°F.

(10) After an optimum has been reached, a sudden marked drop in temperature slows down secretion. (Note the data on March 17, Plant A, Range 4.)

(11) A temperature of 90° or more at hive level means, of course, a much higher temperature at the roof, and hence at that temperature bees are overcome or incapacitated for work, and fall to the ground or cluster helplessly on rafters or plants unless ventilators are opened; in that case, they fly out and so escape the disastrous effects of high temperatures.

Comparison with Kenoyer's Observations.

A comparison of the data observed above, and the conclusions recorded by Kenoyer, in Bulletin 169, Iowa State College of Agriculture, 1917, ''The Weather and Honey Production,'' and also his Bulletin of the Iowa Experiment Station No. 37, ''Environmental Influence on Nectar Secretion,'' are interesting, not to say convincing.

His deductions, made on the data gathered by Mr. Strong of Clarinda, Iowa, are fifteen in number, the first few of which refer to the Iowa seasons by months, to the influence of rainy seasons, and to the direction of the winds. No. 8 in his summarized conclusions reads, ''Good honey months average slightly higher in temperature than poor, this being especially true of the spring and fall months.'' No. 9 reads, ''Clear days are favorable to production of honey.'' No. 10 is, ''Yield is best on days having a maximum of 80 to 90°F.'' No. 11, ''A wide daily range of temperature is favorable for good yield.'' No. 12, ''A low barometer is favorable for a good yield.'' No. 13, ''The fluctuations in yield for a producing period seem to be closely correlated with the temperature range and the barometric pressure, acting jointly.''

His deduction No. 8 means that there are for different flowers temperatures too low for good nectar secretion. In the greenhouses we found no nectar in the cucumber blossom below 60°F., but only dried-down crystals of sugary nature remaining on nectaries. Regarding No. 9, sunshine in greenhouses always seemed to accompany best nectar secretion below 80°F.; above that, it accentuated the drying up of nectar. As stated earlier, however, it is hard to separate the sunshine from some other factors favoring nectar secretion. As regards No. 10, the yield from the clovers, basswood, and smartweed is optimum at a range between 80 and 90°F. Cucumbers seem to yield best ten degrees lower, that is, between 70 and 80°F. No. 11 is especially interesting in a comparison with our greenhouse conclusions. The evidence in the cucumber nectar-secretion tests is decidedly in favor of the conclusion that a lower minimum produces better secretion than even a minimum of 60°F. The plants are usually watered about two o'clock in the afternoon; and it was noted often that the bees seldom worked on the blossoms during nor after a watering; the air in a greenhouse, after a thoro wetting down, such as is given daily, is humid and sultry, much like a midsummer day when the sun comes out after a heavy shower. Even in those houses where the watering is done under the vines about the roots, and not by overhead spraying, the effect of the great humidity ensuing always seemed to check or stop the activity of the bees and the deposits of nectar, in some degree at least. Probably accurate barometric readings of the houses under observation would be more conclusive. As to Kenoyer's deduction No. 13, about the effect a temperature range and barometric range acting jointly have on nectar production, further tests in houses under glass must be made, and will be made this year, to determine if possible what the correlation is of these two factors.

As the greenhouses shut out all winds, and the moisture on the soil is regulated and always ample, no comparison with outside conditions is possible here.

Low Night Temperatures Favor Elaboration of Sugar.

Mr. Kenoyer's conclusions are that low temperatures favor the accumulation of sugars in the stems and tissues of the base of the blossoms, while high temperatures favor the secretion of the accumulated sugar. It is interesting to note, that one set of greenhouses were at first heated considerably higher than the houses of the remaining growers; and so long as this condition prevailed, that particular grower got much poorer activity from his bees under glass, and consequently "kicked" vigorously at first! When his attention was called to the fact, the high night temperature was lowered somewhat, after which the bees worked better, and the nectar showed more abundantly in the blossoms.

Ashtabula, Ohio.

DIAGNOSING COLONIES

Some Outside Indications of Internal Conditions. Reading Conditions by a Glance at Entrances

By E. R. Root

THE term "diagnosing," when used in bee culture, applies to a method or methods of determining the internal condition of a colony from surface indications. mainly at the entrance, and without opening the hive. In the height of the honey flow, expert beekeepers, when rushed with their work, can tell pretty accurately what colonies in the yard are or will be needing attention by a glance at the hive. The knowledge of how to do this enables the expert to administer treatment at once to colonies that would be likely to swarm, or which might otherwise begin to loaf for the simple reason that they have no storage space available.

To go thru every hive, comb by comb, in the height of the season would be impossible; and so the expert beekeeper picks out by surface indications first those colonies that need attention at one or more of his yards, then, later on, takes care of those that are in no urgent need of care.

To Determine Whether a Colony Needs Room.

Now then for the "know how." The most reliable indication of what a colony is doing or will do is the flight of the bees going in and out of the hive. If one colony, for example, has its bees pouring in at the entrance by the score, and coming out in the same way, and another one right by the side of it has only one-half or one-fourth as many going in and out, it is evident that the first mentioned is very strong and will shortly need room, even if it does not already. The last-mentioned colony may have a poor queen. It may have had poor food during the winter, or insufficient protection. As a natural consequence it will probably have only about one-half or one-fourth as many flying bees. It will not need more room, and for the time being can be allowed to take care of itself. The other colony, with its busy rush of bees going in and out, should be opened up. If it has little spurs of wax built along the top edges of the comb, if it is full of brood, and if, further, storage space is being cramped, another super should be added. In five minutes' time one can go thru 100 colonies, laying a stick, block, or a small stone as a distinguishing mark on top of the strong fliers and heavy hives. All others he will ignore for the time being. He and his men will then proceed to examine the indicated colonies first. Later on, when he has more time, he can take care of those that are not flying strong.

At this point the beginner, at least, should make a careful distinction between the playflights of young bees and bees that are rushing to and from the fields. In the case of the former the bees will be seen flying nervously around the entrance, some going in and some flying aimlessly around in the air for several minutes near the front of the hive. When busy at work going to the fields they will fly from the entrance directly to some distant point, as soon as they rise above surrounding objects. In the same way they will come in from the field going directly into the entrance, or perhaps dropping on the alighting-board or ground near by if heavily laden.

Neither must the beginner be confused by a case of robbing and bees actually at work in the fields. When the colony is being robbed out, only one hive, or at most two or three, in the apiary will be involved. The sound of robbing is quite different from the sound of actual workers. In robbing, the bees stealthily dodge in at the entrance as if they expected to be grabbed by the defenders of the home. Real busy honest workers going to and from the fields show no such dodging or nervousness.

How to Detect Inclination to Swarm.

Another surface indication of swarming

is a large bunch of bees—three or four quarts of them—clustered closely around the entrance of the hive during the middle hours of the day, with only a few bees flying to and from the field. When a colony persists in doing this while other colonies are actively going to the fields, an examination will probably show swarming cells more or less toward completion.

During very hot sultry weather in the height of the flow, perhaps half of the best colonies in the apiary may have a quart of bees clustered out in front at night. This indicates nothing abnormal; for when all the field bees are in the hive there is not room enough to accommodate them and yet allow for proper ventilation.

The Presence and Kind of Queen.

There is another indication of the internal condition of the colony, and that is, the way bees carry in pollen. It used to be said that they will not bring in pollen if a colony is queenless. This is true only in part. When it needs pollen it will bring it in whether there is a queen or not. But a colony that has a good queen, and plenty of room for breeding, will require much more pollen than one that has no queen or a poor one. When it is possible to see many busy flying bees going into the hive, and a great deal of pollen going in, it indicates that that hive probably has a good queen, and that breeding is progressing in a perfectly normal manner. But when little or no pollen is coming in, and the bees are not flying much, it shows that the colony did not have a fair chance during winter or spring, or that it has a poor queen. On the other hand, the colony may have ever so good a queen; but if there is any large amount of foul brood, either American or European, there will be but little need of pollen.

Dead Brood at the Entrance.

If one can tell the difference between a young baby queen and young workers dead at the entrance he will be able to tell whether supersedure is taking place within the hive. If the old mother fails the bees will proceed to raise a number of cells. The first virgin that emerges will be quite liable to puncture the cells of all of her rivals and sting them. These victims will be thrown out at the entrance, clearly indicating that some young miss is boss of the ranch.

An inspection of the entrances will likewise show, oftentimes, whether a colony is on the verge of starvation, whether its brood has been chilled or overheated, or whether there are moth worms in the hive. When several full-grown larvae or perfectly formed young bees, brown or yellow, are found dead in front of the entrance, it may indicate any one of the possibilities just mentioned. When the bees are on the verge of starvation they will not only stop brood-rearing but they will carry out their young larvae. They apparently go on the principle that they should save able-bodied living bees rather than to lose all in the attempt to raise the babies.

In early spring some of the young brood near the outside edges may become chilled. This brood will be taken out of the cells and deposited in front of the entrance. At other times, if the hive-entrance should be closed for a short time on a very hot day so that the bees are on the verge of suffocation, not a little of the brood will be overheated. That which dies will be carried out in front.

When the moth worm is present some of the brood will be destroyed along the line of the galleries made by the worms. These will be deposited in front of the entrance the same as larvae dead from any other cause.

The presence of dead young brood out in front of the hive is always an indication that something is wrong. When it is dead from overheating or chilling there is nothing that the apiarist can do, because the damage is already done; but when it is dead because of near starvation, colonies should have immediate attention. In the case of the wax moth, the galleries should be removed as soon as it is convenient to do so.

Adult Bee Diseases.

The presence of bee paralysis or of the disappearing disease can be determined by the behavior of sick bees in the grass near the entrance. Bees affected with paralysis have swollen bodies looking something like those that are affected with dysentery. Occasionally they will void a yellowish transparent fluid, but not an opaque yellow, or a brown or black substance such as appears in the case of dysentery. Bees affected with the disappearing disease show no swollen abdomens. They will run at a furious pace in the grass, some of them crawling up on spears of grass and weeds, and finally dying.

Foul Brood by the Odor.

The presence of American foul brood in an advanced stage can sometimes be detected by the odor at the entrance of a hive affected. When one finds, as he goes thru the apiary, an odor resembling that of an old gluepot, having some suggestion of spoiled meat, he would do well to place his nose near the entrance of some of the colonies. Such diagnosis for foul brood, however, is by no means reliable; but when the familiar odor is detected near a hive, all colonies near by should be examined.

Occasionally the old queen may be found in front of the hive dead. If it is during the spraying season it may be surmised that she was killed by one of the poisons used for spraying fruit trees, to kill the codling moth. The hives should be examined at once, and either a laying queen be given or a ripe cell.

FROM THE FIELD OF EXPERIENCE

HONEY EXTRACTING EXHIBITS

Extracting and Bottling Honey an Attractive Feature at the Minnesota State Fair

The beekeepers of Minnesota have their own building at the State Fair, called "Bees and Honey Building." It is a large building. The exhibits are divided into three classes: Quality exhibits, displays, and educational exhibits. The State Fair board gives prizes amounting to $1,200 on quality exhibits and displays, and allows an extra sum for educational exhibits. One of these exhibits is the extracting exhibit. The fair board has purchased a four-frame extractor run by electric power, uncapping tables, honey tanks, heaters, and a bottling outfit. The whole exhibit is on a raised platform 20 x 12 feet, surrounded by a heavy rail. Arrangements are made every year in the spring with some large beekeeper to produce extracted honey in attractive and well-built frames. Before I went to Europe, during the war, I furnished the honey for extracting. Dr. L. D. Leonard of Minneapolis has had the contract since. The State Fair board pays for all hired help and actual expenses of extracting, and grants the exhibitor sole right to sell his honey during the State Fair week to visitors. After the fair is over all exhibitors may sell their honey, beginning Saturday afternoon.

The extracting exhibit is in operation from 8 a. m. until 6 p. m., from Monday to Saturday. One man does the uncapping, one runs the extractor, one lectures from the platform and answers questions. Two women are employed at bottling and labeling, and three or more are selling honey from an attractive counter adjoining the extracting outfit.

Two storage tanks are used, each of 100 gallons capacity. Honey is bottled from one tank while it is settling in the other.

Two problems have always been hard to solve in connection with the exhibit: First, to keep the otherwise mussy job of uncapping and handling frames, also the uncapping table, extractor, tables, floor, etc., so clean that the public is pleased to see it; and secondly, to keep robber bees from entering the building thru gates which necessarily must be kept wide ajar all day long.

The extracting exhibit has made the public in Minnesota acquainted with the nature of extracted honey and its mode of production, and has thereby removed a great deal of prejudice and improved the sales of extracted honey. The State Fair board considers the honey-extracting exhibit one of the most attractive and popular exhibits at the fair. The total paid admittance at the Minnesota State Fair in 1920 was 535,000.

Francis Jager.

University Farm, St. Paul, Minn.

A·L·KLEEBER
By Parcel Post
To North & South
And the East

A small part of the Wisconsin State Fair honey exhibit, 1920. This was a large and impressive exhibit.

FROM THE FIELD OF EXPERIENCE

GRANULATION IN BAIT SECTIONS

Effect of Minute Crystals of Honey Left in Cells from Previous Year

In May Gleanings J. E. Crane states on page 274: "If we only knew the reason why honey in sections of comb drawn the previous season is more inclined to granulate than in combs recently drawn from foundation, we might in some way avoid the difficulty and so use our last year's half-filled sections very much to our -advantage."

Long ago I noticed, when partly filled sections were run thru the extractor at the end of the season and stored away without being cleaned up by the bees after extracting, that in the following spring these combs often contained minute crystals of granulated honey, and that the new honey stored in these combs usually granulated in the winter. On the other hand, when the partially filled sections were emptied by the bees in the fall, or even cleaned up by the bees after extracting there was less granulation in the combs the next season.

Probably the reason for more granulation in old combs than in new ones is that small crystals of old honey in the cells start crystallization in the new honey. Granulation of honey is crystallization.

It is well known among sugar manufacturers that when a pan of syrup is very slow to grain that the addition of a little granulated sugar or sugar dust to the boiling syrup will often hasten crystallization. In purifying some chemical salts by recrystallization it is sometimes necessary to add a small crystal of the salt to start crystallization in the liquor. A mere sudden jar will start crystallization in supersaturated solutions of sugar syrups, and in some salt solutions as well.

Having the combs perfectly dry and clean seemed to avoid granulation with white clover honey. If any honey, either comb or extracted, is kept at a fairly even temperature, and not stirred or jolted, it has always seemed to me that it is less inclined to granulate. A. N. Clark.

Charlotte, Mich.

* * *

HOW MANY BEEKEEPERS?

American Honey Producers' League Has Addresses of Only 2280; How Many More are There?

How many beekeepers are there in this country? Ever since the 1910 census the writers of beekeeping literature have referred again and again to "the 80,000 beekeepers of America." Are there that many? I am beginning very seriously to doubt it.

What constitutes a beekeeper? Simply owning a colony or two of bees surely does not make one. To my mind a beekeeper is one who not only cares for his bees but takes some interest in the honey-producing business and the marketing of his product.

Do not be startled if I make the assertion that there are less than 2½ per cent of the number above referred to that are beekeepers. I hope I am wrong, but I have a set of facts that bear out my belief.

About two years ago we decided that our condition was almost unbearable, and about three dozen men met in Kansas City from all portions of the nation to formulate plans for the organization of a central national league or association of beekeepers. A half dozen meetings have since been held and every bee paper has given the movement publicity.

Last month the American Honey Producers' League issued a bulletin, giving its constitution, membership, personnel of committees, etc. Exactly 2280 copies could be mailed out, because 77,720 of you beekeepers had so little interest in the movement that you would not let your identity or address be known.

Why the timidity? Were you afraid we would ask you for money? You were right. We are going to ask you for some. The league needs money. If the beekeepers of America want a league that will do things they must pay for it. The American Honey Producers' League is doing great and good work. It needs and deserves your moral and financial support.

Whether your State is affiliated or not you may become a sustaining member upon payment of $10.00 into the league treasury. Every beekeeper and affiliated interest can help. Will you do your share?

San Antonio, Tex. E. G. LeStourgeon.

* * *

NEED OF ADVERTISING

Seventy Per Cent of the City People Think Honey in Groceries Not Real Honey

National Honey Advertising, as per Gleanings of March number, page 150, by T. V. Damon, is so much like the idea I have expressed to a great many beekeepers privately that I feel like entering the scheme at once. I think all beekeepers who will take time to learn what the city people think about honey they see for sale in stores, and also to learn or notice how manufacturers advertise their product, will surely join a National Honey Advertising fund.

Perhaps 50 per cent of city people think all honey in grocery stores is manufactured or adulterated. I give here one experience I

FROM THE FIELD OF EXPERIENCE

had while in Philadelphia awaiting a consignment of 47 barrels of honey from my bees. I saw a big display of section honey in a grocery on Market Street. While standing in front of the window looking at this honey, people passing by would stop to see what attracted me. I would ask them, "Do you think that is real bees' honey or some manufactured stuff?" Ten said they thought it was manufactured, and I asked, "Why do you think so?" They said, "Because I know they can and do manufacture it." Two who had friends that had kept bees, thought what they saw was real honey. One who had been a beekeeper thought what he saw in the window was bees' honey. One man who was a chemist knew comb honey could not be manufactured. So you see from that experience I concluded that 10 out of 14 of the city people think the honey in groceries is not real honey.

How can we hope to have people pay a reasonable price and buy often anything of which they have such a poor opinion? If you approach people to see what they think of honey, don't let them suspect you know anything about it. If you do, you cannot get their real opinion. There are but few people who know what makes different samples of honey differ in color, odor, or flavor. If the city people all knew, say, 12 to 24 of the leading facts about honey and bees (which beekeepers know), I feel sure all the honey produced in the United States and Canada would be consumed on the tables each year by or before the new crops would be offered and at a price satisfactory to beekeepers.

Let beekeepers give to a general advertising fund, say, 10 cents per colony annually. Do this to give people facts about honey. What do you say? Come! let us do business like business men! Let dealers and bottlers advertise their particular label of honey independent of the above proposition.

Pike Road, Ala. W. D. Achord.

* * *

TO EMPTY UNFINISHED SECTIONS

Bees Refuse to Move Sealed Honey. Loss of Honey when Feeding Back

Two years ago I tried a plan on a small scale similar to the Deadman plan described in August (1920) Gleanings for getting unfinished sections cleaned up. I selected a strong colony, put on a super with inch starters in the sections, put a bottom-board close to the side of the hive, on which I piled four high the supers of unfinished sections and closed the entrance to the supers from the outside. Then I took a piece of 2 x 4 scantling as long as the width of two hives, hollowed out a groove on one side after the fashion of the Alexander feeder, and put it under the back end of hive and supers so the bees could pass freely back and forth between the hive and supers.

For a short time the bees went for the unfinished sections like robbers, but as soon as they found they had it all to themselves they cooled down and refused to uncap anything that was capped over. I took away two of the supers so I could get at the other two, uncapped the honey for them, took out the sections as they were emptied, and put in others, all the time watching the super above the colony to see that they had room to store the honey. In that way I forced about 100 pounds of nice clear honey on to them, but it took a month to do it. By that time the nights were getting too cool for comb-building.

Honey exhibit at the Bahia Exposition, Bahia, Brazil, 1916.

When I took off the super I had some more unfinished sections—about 20 pounds of honey in a 32-section super. What the bees did with about 80 pounds of that fed-back honey I will never tell you.

The plan looks good in theory, but in practice it was a failure. If I try it again I shall use unfinished sections above the colony, but in that case we would get patched-up and unsightly sections. William Cox.

Oakland, Ill.

[The patched-up appearance of sections of honey which are finished by "feeding back" can be prevented if no sections that are partly sealed are given to the bees for completion. Any that are partly sealed may be uncapped before being given to the bees. Of course, if the unfinished sections are well filled, having the cells built out full depth, it should not be necessary to uncap them to secure well-finished sections. The patched-up appearance is caused by the bees beginning to seal the honey before the combs are fully built out, in which case the unsealed cells are elongated beyond the sealed portion of the comb when the feeding is begun. The loss of honey during the process of feeding back was excessive in this case. No doubt much better results would have been secured if the unfinished sections used for feeding had been extracted and the honey given to the bees in a feeder. When this is done, a little water should be added to thin the honey so the bees will handle it more rapidly. The faster the honey is fed, the less the loss should be during the process of feeding.—Editor.]

CLEANING QUEEN-EXCLUDERS

A Simple Method which Does Not Injure Wood-Wire Excluders

I have for years cleaned the wax and bee glue from queen-excluders by using the Root hive-tool. Lately I took home from the outyards 150 wood and wire excluders well covered with burr combs. I placed 25 on end in my wax boiler with wood slats below and put in one pail of water. In a few moments I had good steam, and, as the excluders had spaces between with the wires up and down, the steam in a few moments cleaned them like new. I took them out and put in another lot, and so on. All were cleaned much better than by any other way I had used. The wood was not in the water, and I cannot see that they are injured in the least. Never more will I clean excluders by scraping. Steam does it much better and faster. N. E. France.

Platteville, Wisconsin.

AMERICAN FOUL BROOD

Should Diseased Colonies be Permitted to Store Surplus Honey Before Treatment?

The article on page 426, Gleanings for July, by A. C. Ames, gives one side of the effect of handling American foul brood in the manner which he describes. It seems but fair that the other side should also be presented, and I can best do this by giving my experience.

I live within the zone of Camp Dix; and when the camp was opened a Philadelphia company secured possession of an abandoned tomato-canning house here and bottled a beverage known as ''Quako,'' which was sold principally in camp. Eventually the sugar shortage came on and the Quako Bottling Co. was unable to secure enough sugar for their concoction, and honey by the barrel was purchased to be used in sweetening the product. When the honey barrels were emptied they were rolled upon the freight-house platform with bunghole open, the outside sticky with honey.

I have maintained an apiary of 40 to 60 colonies of bees within a stone's throw of the freight-house platform. During the nectar dearth, whhich always occurs here from about July 10 to Aug. 25, the bees partook freely of what they could get (and they got plenty) from the sticky barrels, much to the disgust of the freight handlers. American foul brood promptly appeared in the apiary (not having been there previously); and the yard has gone down to 15 colonies and no crop has been secured in three years because of the disease, entailing a financial loss of well nigh $1000, besides the great amount of labor.

Mr. Ames does not say he destroyed the foul broody honey nor boiled it to render it free from infectious germs, and I assume he puts it on the general market. It might be well for any who have thought of adopting some such plan to remember that this honey may come back to their apiary, and to have a thought for their own welfare if they do not have much for the welfare of others. Elmer G. Carr.

New Egypt, N. J.

THE THREE MEDINAS

Three Centers which Have Greatly Influenced Beekeeping

The oldest Medina (the Arabic term for town) is known all over the Mohammedan world as the ''town of the prophet,'' or Medina-t-in-Nabi. It was from Medina that the principles of Islam were first announced to Arabia. Altho Mohammed was born in Mecca, in the year 578 of our era, he passed his childhood days in Medina, where he died at the age of 63, and was buried in his beloved city in 691. He dictated the sixteenth Sura of the Koran there, entitled ''The Bees.'' Like every Arab, the prophet was very fond of honey; and whenever any sufferer approached him to ask him for help for his ailments the prophet always recommended honey. In later years honey was ordained even for moral sufferings. ''Honey,'' he said, ''will alone cure you if it is Allah's will.''

A man suffering came seven times, as honey had not calmed his pains. Every time the prophet repeated, ''Take honey.'' On his seventh visit the prophet said, ''Drop into your honey seven pebbles taken from the hot oven.'' (The Arabs use a clean pebble to spread the dough on the oven in preparing the bread of life, which is sacred. ''Doing this,'' continued the prophet, ''you must be cured,'' and thus it was.

FROM THE FIELD OF EXPERIENCE

Mohammed believed in the infallibility of honey, and therefore wrote two verses out of the 128 which form the chapter on bees. These two alone mention bees in the following:

"Your Lord inspired the bee to build its dwelling by gathering the material from the mountains or trees and creeping plants. He inspired her to suck from all kinds of fruit, and fly about in quest preparing in its body a many-colored fluid in which salutary principles are contained to assist humanity"—a plain hint for any reflective community.

Bees were thus consecrated, and every good believer will handle his bees kindly. The only time the Moslem meddles with the bees is in the swarming season to lodge them comfortably, and in the honey harvest, when he carefully takes out a portion of the honey without touching the brood-nest. This does not mean that no Mohammedan will be rude to his bees; but they have a kind of guarantee. In consequence, all over Islam, or countries where Mohammedans have ruled for a considerable length of time, as in Spain and the Grecian Archipelago, the primitive hive is laid down horizontally, thus rendering the suffocation of bees by brimstone not impossible but at least very difficult.

The second Medina is a large town situated in a fertile district in northern Spain, in the province of Castile, and is entitled Medina del Campo. When the conquering Arabs on their way to France in the seventh century saw the beautiful district they founded this city in remembrance of the desert Medina, the far-away home whence they started. To distinguish it from the Medina in Arabia they called it the flourishing or agricultural Medina. From this center, bees, beekeeping, and the value of honey were spread over all the Iberian Peninsula. The system of horizontal hives spread everywhere, even to the foot of the Pyrenees on the Spanish declivity.

The Mohammedan hives are still in use. Altho the Arabs left the north of Spain as early as the twelfth century, and were finally expelled from Granada in the south in the fifteenth century, these teachings were still so convincing that the respect for the honeybee and the belief in honey are now as strong as in the days of the Caliphate of Cordova and the kingdom of Granada. A Spaniard told me that there was no use in getting several pesetas (the monetary unit in Spain) for his honey when the bees have gathered all the salutary sweet for a remedy in all diseases. Pointing to his children running about the hives, "What would they do during epidemics and during cold days if we had not this remedy on hand?" Tho a Christian he seemed still impressed by the verses from the Koran which had been repeated to his Arabian ancestors for generations. He thought it sinful, likewise, to part with his bees, as they are considered to be a part of the family. The hives, he told me, were made ages ago by his grandfather.

As for the third Medina, the Root Company knows more about it, at least how it originated and took its name from the other Medinas. But has it not been another bee sanctuary whence hives, bees, and everything pertaining to bee culture have spread over a part of the dominion, as the Arabian and Spanish Medinas have influenced the Moslem world? Indeed, Medina, Ohio, has influenced the bee world—that is, all around the globe. The Medina in bee culture, or Gleanings, or Root, is all identical with bees and honey—Airline honey of the veteran beekeeper. P. J. Baldensperger.

Oran, Africa.

RIVERSIDE COUNTY
BEE KEEPERS CLUB

Exhibit of the Riverside Beekeepers' Club at the Southern California Fair at Riverside, Calif., 1920. In addition to the display of honey, there were nearly two tons of wax, ten colonies of bees in glass hives, and several special features such as a model in miniature of an apiary and honey-house nestled in the midst of orange groves. At the back is a display of 105 varieties of honey-producing plants of California pressed and mounted.

SIFTINGS

J. E. Crane

AT the bottom of the beautiful cover page of Gleanings for July is a quotation from Morley Pettit, ''One of the pleasures of a beekeeper's life is the trip home from an outyard after a hard day's work.'' ''That's so,'' I exclaimed, mentally if not aloud. How many times have I enjoyed these trips home, so quiet and restful, even when I had to walk up the long hills to relieve my patient horse hauling a heavy load of honey!

* * *

The method advocated by Mr. Pettit, page 412, for getting combs cleaned up after extracting is certainly simple and effective, and better than many of the plans heretofore described.

* * *

Conditions here in Vermont are not promising a large crop of honey. The weather has been very dry most of the time since May 1, and, while some yards are doing very well, others have made little more than a living.

* * *

One of the wants of beekeepers for many years has been a perfectly sure method of introducing a strange queen into a nucleus or colony. The cage and method described by Jay Smith on page 417 is as nearly perfect as we shall be likely ever to find. The idea of a push-in cage, however, is not new. Capt. J. E. Hetherington described it to me—in fact, made one for me of wire cloth 49 years ago. At that time he recommended this method as one of the safest for introducing queens.

* * *

That is a right good article by S. B. Fracker, on page 422, on ''Compulsory Honey Grading.'' It looks very much as tho those Wisconsin beekeepers were on the right track. Such a law will give ''back yard'' beekeepers a jog that will set them, as well as other producers of food, to thinking. It is a fact that ought to be often repeated, that mixing a low-grade product with a high-grade rarely raises the price of the low-grade, but almost invariably lowers the value of the high-grade product.

* * *

In the first short editorial on page 409 it is stated that July is an excellent time to requeen. Not only is this true, but it is the least expensive time as well as the best time to secure the best stock, and no one has so good a chance to secure good stock as the honey producer himself. It is a comparatively easy matter to notice the great difference in a yard of bees in the storing of honey. In a yard that will average 40 pounds of surplus honey, we are quite sure to find one or two colonies that will store 80 or 100 pounds of surplus honey. How easy to rear one or more sets of of queen-cells from such colonies, to replace queens in colonies that have proved the least productive!

* * *

''Leave more honey for the bees,'' says the Editor of Gleanings, page 410. Certainly good advice where a yard is run for extracted honey, and worth remembering when run for comb honey. We had colonies starve last year in outyards that we used for section honey before we got around to feed them for winter. There was an unusual dearth of honey the latter part of the season.

* * *

''It is up to the beekeeper'' says D. C. Stahlman, page 429, and he is right. The crop of honey will depend much more upon the beekeeper than we are apt to think. I was recently visiting some beekeepers in the north part of our State, and while I found some yards with strong colonies, other yards were comparatively weak. While the strong colonies were storing surplus, the weak ones were busy filling their hives with brood, and will store very little surplus unless there should be a good flow of honey late in the season.

* * *

A. C. Ames, on page 426, gives to those who are trying to overcome American foul brood some excellent advice which all may adopt with very decidedly satisfactory results. But European foul brood! This is indeed the ''pestilence that walketh in darkness'' and ''wasteth at noonday.'' You can scarcely tell whenever it comes, or where it is going to turn up next. There seems to be a good many exceptions to its general methods of development and disappearance; but one thing seems pretty certain, that with strong colonies of Italian bees we can fight it successfully.

* * *

That estimate of Mr. Demuth, on page 410, of the average amount of comb and extracted honey secured by colonies of equal strength is most decidedly interesting. I have been satisfied for some time that the early estimates of two pounds of extracted to one of comb were quite too high. A beginner extracting honey before it is well ripened or some one having a somewhat peculiar location like the Dadants, or a heavy late flow, may secure two pounds of extracted to one of comb. I believe those who extract leave far less, as a rule, in the brood-chamber than those who work for section honey.

Beekeeping as a Side Line

Grace Allen

MORE perhaps than any other branch of agriculture, beekeeping has a generous list of great and beloved names folded down in its chronicles. Even after laying aside the thought of literary sideliners like Virgil of old and Maeterlinck of today and others like them (are there any others like them, tho?—will there ever be?), men who have immortalized the charm of the bee, there are still practical apiculturists, experimenters and scientific investigators whose names are dear to the entire beekeeping fraternity.

From among them all, could only one be selected for a sketch who would not choose the great Swiss naturalist—blind Francois Huber? It is good to renew, in even the small measure of such an article as this, our acquaintance with this dauntless soul.

He was born in Geneva, Switzerland, in 1750. What a city and what a time for a scientist to be born in! Horace Benedict de Saussure, the eminent Swiss physicist and geologist, who at 22 years of age accepted the chair of physics and natural philosophy at the University of Geneva, was a romping boy of 10 years when Huber, his future famous pupil, was born. Charles Bonnet, another great Swiss naturalist and philosopher, was 30, but he guessed no more than the boy De Saussure how great and dear a friend was born in his own native city that day. This was the same Charles Bonnet who had startled the scientific world 10 years before, when only 20, with a paper on aphids, in which parthenogenetic reproduction was first described. No wonder this achievement made him, young tho he was, a corresponding member of the French Academy of Sciences. This was a full century before Johann Dzierzon, the pastor of Karlsmarkt, grew from a sideline beekeeper into a special student of apiculture and with the aid of his detachable cells discovered the parthenogenetic origin of drones.

Huber's own family was well-known and wealthy. He probably never remembered his great-aunt, Marie Huber, for she died when he was only three years old; but she was a literary woman of wide interests, not only a tireless writer on religious and theological subjects, but also the translator of the Spectator. Then there was another relative with a fine chemical laboratory, who, alas, could not, even in the modern, progressive, scientific spirit of the Geneva of the mid-eighteenth century, lay aside his stubborn belief in alchemy. How long and patiently they labored, those old alchemists! And there was the boy's own father, Jean Huber, from whom he inherited his deep love of nature and keen powers of observation.

What a brilliant, gay, lighthearted, charming and likable gentleman this Jean Huber must have been. Known as a wit, he had also many and varied talents—he was a poet and a musician, a painter and a sculptor, and he served for many years as a soldier. But he took life lightly, tossing the hours about like bright-colored balls to be played with, and so made no lasting mark in any line, tho his ''Observations on the Flights of Birds of Prey'' won him considerable reputation. However, he was doubtless a delightfully entertaining daddy. What music he could make! How he loved the out-of-doors and what fascinating things he could discover there and what secrets he could then tell about them! What strange and splendid specimens he had collected! And what miracles he could perform with a piece of paper and a pair of shears! Indeed, the cutting out of landscapes and silhouettes from paper became such an art in his hands, that he may fairly be called its originator. How he must have amazed and delighted grown-ups as well as children that time he tore a profile of Voltaire from a card with his hands behind his back—and that other time when he broke his own record by so skillfully guiding and turning a flat piece of cheese that his cat ate out therefrom another profile of Voltaire! Fortunately only his brilliance and talent descended to his son, and not the undue levity that undoubtedly marred his own career.

This father's library, his cabinets of specimens and his rich observations roused in the boy an early and unceasing love of nature, which was well developed into methodical observations at an age when few children have learned to observe at all. Then there were also the usual social activities of the children of such families, and young Francois was sent to dancing school. So, too, was little Marie Lullin, whose father was one of the Magistrates of the Swiss Republic. They became childish sweethearts, these two. But oh, how little their child hearts guessed, as they followed the steps of their dancing master, the greatness of the tragic days to come.

From early childhood Francois attended lectures at Genevan College. Before he was 15, he had completed a course in physics under De Saussure. He had familiarized himself with chemical manipulations in the laboratory of the old alchemist. But a too intense and steady application to his studies and the habit of constantly reading late into the night by dim lamplight or dimmer moonlight seriously injured his health. At fifteen, he broke down, utterly prostrated and threatened with blindness. His terrified father—all gayety forgot—rushed him to a famous doctor in Paris who ordered him to the country. Near Paris is the quaint little village of Santi, and here the boy Huber ploughed and sowed and milked and lived the life of an ordinary peasant lad. His youthful strength rebounded swiftly and he returned to the city with vigor completely restored. But there another doctor, a celebrated oculist, broke to them the solemn news that his eyesight could not be saved. Slowly but surely he was to become totally blind. One eye had the same disease that had ''quenched the orbs'' of Milton—amaurosis; the other had cataract, which the doctors were unable to cure. Francois and his father went back to Geneva. And the boy went bravely on.

The childish love between Francois and Marie was deepening with the years, and now his only fear was that his affliction might alienate her. So he constantly minimized its seriousness, ever to himself, scarcely admitting its steady desolating development. He talked always as tho he could see perfectly, and so formed the habit, later carried so noticeably into his writings, of speaking about seeing with perfect clearness what he saw only with the inner eye—altho there certainly with perfect clearness. But he need not have worried about Marie. Her affection was so deeply rooted that not even her father's bitter opposition, which at times amounted to persecution, could turn her from this great-souled young man who was so soon to pass into complete outer darkness, but who held so bravely and steadily to the stronger light within. As soon as she reached her majority she married him, shortly before he became totally blind. The tender devotion that brought her to that shadowed altar made beautiful 40 years of married life. She was at different times her husband's reader, his secretary, his observer; and was always closely absorbed in the work that absorbed his attention. When he was an old man he once said, ''As long as she lived I was not sensible of the misfortune of being blind.''

Another close personal association came to Huber thru Francois Burneus, whom he first employed as a servant. Soon, however, the keen inner sight of the master had discovered in the man those rare talents that make the skillful observer. So Burneus became his invaluable and highly trained assistant in working out his one life purpose, research into the life and habits of the honeybee, displaying remarkable patience and skill thru countless experiments and under literally thousands of questions, by which Huber guided, directed, sifted, and tested his efforts. In one experiment to learn something about laying workers, Burneus caught one by one every bee in two hives which were suspected of having laying workers. This required 11 days of steady work, during which time he stopped only long enough to rest his eyes (the pathos of the master's insistence upon this!). Huber gave public testimony to his worth, insisting upon sharing his own honors with one who ''counted pain and fatigue nothing compared with the great desire he felt to know the result.''

The results of Huber's observations and his long extensive investigations were written as letters to his famous naturalist friend, Bonnet, whose own sight was failing so that he had given up his active scientific investigations and was devoting his later years to philosophy. When these letters appeared later in book form as ''New Observations on the Honeybee,'' some scholars at first raised mental eyebrows and smiled doubtfully at observations conducted by a blind man assisted by a peasant. But that attitude could not last. Scientists are necessarily just and honest, and these swiftly threw aside their first prejudice and accorded to Huber's book the great place it still holds after the passing of all these years.

He wrote in a wonderfully lucid style with lively picturesqueness—clearness of phrase growing out of clearness of vision, inner vision. His work is marvelous in its accuracy and fullness. Boundless patience and infinite skill unearthed hidden truths for him that had been searched for in vain for generations, from the seekers of ancient days on down to his own eminent friend Bonnet.

He built the first observation hives—one for a single comb and others for several combs, opening like books with hinged leaves, each leaf containing a comb. Among his important discoveries are the fertilization of queens in the air, the development of the eggs of an unmated queen into drones, the rivalry of queens, the origin of propolis, the origin of wax, the ventilation of the hive, and facts about the antennae and laying workers and swarming and different senses.

Huber's mind was strong and active. Like his father, he loved music. He had mastered counterpoint, and could build the harmonies of a musical composition when the bass was dictated to him. After one repetition it was his own. He invented a printing machine on which he corresponded with his friends. He loved to walk in the open air, and arranged to have knotted cords strung along the rural walks around his home, so that he could follow these paths without other assistance, and know his whereabouts by the knots.

While he had every advantage that ingenuity and wealth could bring, coupled with the tenderest devotion and quickest sympathy with his work, all of which helped to bring light into the dark days, yet the real source of his serenity lay in his own strong unshrinking soul. To old age he retained a deep affection for his friends, boyish ardor, steady delight in nature, noble enthusiasm, and that sure sympathy for youth which keeps age young. His mental

(Continued on page 524.)

FROM NORTH, EAST, WEST AND SOUTH

In Ontario.—For the last 10 days Ontario has been sweltering under a hot sun, temperatures running from 90° to above 100° in the shade each day. Today (July 8) the heat wave is broken, temporarily at least, by terrific downpours of rain, some three inches falling at our place, and grain in the fields is all as flat as tho a roller had been run over it. Farmers as well as beekeepers have their misfortunes to contend with, and it is hard lines for the farmer to see so much damage done when a few hours before the prospects looked very bright. Some of the grain may rise again, but the heavier fields are tangled so badly that much of the grain will stay where it is till cut. So far as the beekeeper is concerned, probably the heavy rainfall may be a benefit; but that is yet to be proved, as we have had a heavy honey flow ever since the heat wave struck us.

In my last batch of notes attention was drawn to the rather gloomy outlook at the time of writing, but the unexpected has happened again and it looks like a fair crop of honey for Ontario this year. True, some localities report failure; but, on the other hand, other localities have had very heavy yields.

A few days ago I took a hurried auto trip to our apiaries in Wentworth County, and while there I was again forcibly reminded of the uncertainty of beekeeping, and how great are the differences of results in different localities one year with another. Quite a lot of writing has been done relative to the pound-package business, and beginners at least are apt to be misled by conflicting reports. The report I am about to make will merely emphasize the matter of locality and seasons—more particularly the latter—as to how beekeeping is affected by these two factors.

Early in May of this year some two-pound packages were shipped to our Wentworth County apiaries for the purpose of making up a loss of a year ago at one yard at that center. The weather was bad when my son went over to put the bees into the hives at that place, and he brought home a few which were put in the home yard. All came by the same post and from the same shipper and all were alike as to condition. When at the Wentworth County yards a few days ago I noticed that all the package bees placed there had an average per colony of at least 100 pounds of clover honey piled on them. The package bees here at the home yard are not more than ready for the supers yet. Last year these two localities were in just the opposite condition, being very backward at the Wentworth County yards and abnormally developed early in the season here at home. It is only 65 miles in a direct line between the two localities, but what a difference!

Friend Pettit in the last issue of Gleanings gives splendid advice to the producer of extracted honey in more than one way, and one almost envies him the splendid equipment which he has to work with. In the number of supers of drawn combs necessary to take care of the crop in a good year, particularly where a number of apiaries are being operated, he does not at all exaggerate the importance of having a large number of drawn combs or foundation in frames, ready for an emergency. This year we have been taught a very expensive lesson along that line, so I can speak from experience. At one set of apiaries where there are some 400 colonies in five yards, we had a little less than an average of three supers of drawn combs per colony. Last year with a light crop at that place, not nearly all these combs were used, and it was a problem to keep them clear from moths. But this year, following a very light flow early in clover bloom, all at once a veritable flood of nectar was coming in at that place, and in 10 days all supers were on the hives and soon all were plugged. It was impossible to get out supplies on short notice, and with all colonies to be examined to head off swarming, one can imagine just what happened. Extracting was started at once from the top stories; but, for every pound taken off, the bees would have stored at least two pounds if they had had room, since they were very strong and the flow still kept on. I will not soon forget my impressions as I visited all five yards and saw literally bushels of bees covering the high stacks of supers from the top to the very bottom of the hives. Most of them were loafing, as they had no place in which to store any more honey.

This lot of bees are run on the central-extracting-plant idea, and while it has many advantages, I still think that, if we had an extracting outfit with buildings at each place, faster time could be made in extracting in an emergency like this. I think it is no exaggeration to say that, if we could have had five supers to each colony instead of three, at least 15,000 pounds more honey would be to the credit of those bees. That amount of honey even at a low price would buy a lot of supers and foundation even at the high price they are selling. This is not apt to happen again for some time—I mean the flow of honey may not be so free for years to come, yet for this year the extra supers would have paid handsomely, and one would not be feeling that because of being unprepared a fair crop was lost.

While the flow was good at that place, here at the home district where we have eight apiaries, almost no honey came in during most of the alsike bloom. The bees did not build up to normal strength as compared with other years, and they were not ready

FROM NORTH, EAST, WEST AND SOUTH

for the flow when it did come. After all thoughts of a white honey crop were about dismissed for this season at this place, all at once the browning alsike clover and the sweet clover, just in its prime, began to yield, and, if the bees had been up to their usual strength, we would have been able after 10 days of a flow to report a fair crop. As it is, strong colonies are reaching the skyscraper stage and if the flow keeps up for two weeks longer we may yet get a nice crop here.

Buyers and sellers of honey are both in a quandary at the present time as to how prices will rule for the season. A few days ago a representative of one of the big firms talked with me over the phone, and after some of the usual preliminaries he said, "What are you asking me for the crop this year?" I replied, "You fellows usually bid instead of asking for a quotation, what are you offering?" His reply was something like this, "I haven't the slightest idea what I should offer," and I had to confess that I had no idea what I should ask. Naturally no business was transacted, but there was a mutual understanding that as soon as we knew where we were, we would talk the matter over again, and possibly something more substantial would be accomplished. It is a very peculiar situation, to say the least, and there are likely to be wide differences of opinions between beekeepers as to what prices should be, not to mention the matter of the different viewpoints of producers and buyers of our product. J. L. Byer.

Markham, Ont.

* * *

In Southern California.—Reports from the various sections of southern California for the past month change the forecast of our last report but very little. There was a period of several weeks just following the orange flow during which very few apiaries were able to hold their own, and many lost from 10 to 15 pounds per colony. Then the white sage, deerweed or wild alfalfa, and some other plants began to yield enough so that the bees could make a living. Now (July 3) the wild buckwheat, sumac, etc., are yielding very well, and it may be that some beekeepers will be able to get a little surplus honey from these. Reports from the purple sage country—northern Los Angeles and Ventura counties—are much more encouraging and some surplus is expected from that source. That section got from four to five inches of late rainfall, which accounts for their promising condition. The mesquite and alfalfa ranges will make about one-half of a crop. Beans will be late, as many of the farmers had to plant a second time to secure a stand.

Bees do not sell as readily as they did a year ago, and good apiaries have been sold lately for about half what they would have brought at that time.

With the crop one of the smallest in the last 12 or 15 years, prices are not at all encouraging, and buyers are not anxious to buy. The carry-over of last year's honey is quite heavy, and this combined with a lower price is not the most encouraging condition for the average beekeeper. Prices of supplies are declining, so that things will in time get down to a proper level again. All lines of produce are in the same condition out this way, and only time will even things up again.

Different opinions exist as to the results from our three years of the Exchange method of handling the honey crop. Perhaps no more trying three years could have been chosen in all of the history of California beekeeping to try out this method of marketing the honey crop. Outside buyers have paid all the way from 20½ cents down to 10 cents for last year's honey.

Some members can see only the very few who sold at the high figures and cannot see the great majority, many of whom have since sold at the lower figure. It is easy to sell on a rising market, but oh, the vision of "What I might have done!" It was very little honey that sold around 20 cents, which fact is easily proved by the weak market at that time, as the Exchange was ready at all times to fill all orders at the high prices. Some members are sure to be dissatisfied, but the majority seem to feel that they have received as much for their honey or more than they would if they had not been in the Exchange. Many are ready to sign up for a new period of several years. Some of the California exchanges have made new contracts for as long a period as seven years.

With markets established, brands of honey recorded, headquarters, offices, repacking equipment, etc., belonging to the Exchange, our future is certainly bright. Our short crop this year is very discouraging, as it is always more satisfactory to produce a big crop even if the price is not so good. As intimated in our last report, most beekeepers can look back and see where some of the money for last year's crop could have been saved and used to very good advantage in getting thru this short crop.

Corona, Calif. L. L. Andrews.

* * *

In Texas. It is often said that Texas is the too State! it is too wet or too dry or too hot or too something. It was too cold and dry all spring and a honey crop was despaired of; but June came hot and dry and then a big rain and more heat and sun, and now we have too much honey. The horsemint was almost gone when the rains came, and now it is in fine shape and yielding heavily. The mesquite

FROM NORTH, EAST, WEST AND SOUTH

had just commenced to bloom, and every one expected that this would put an end to the honey flow. Mesquite, true to habit, did put out new branches, but with them came new blooms, and almost all of the mesquite country has had a flood of honey. So heavy in fact that, while less than a month ago the crop was 75 per cent below normal, it is now up and in some localities above the average yield.

Locality is brought out very forcibly in this mesquite flow. Small areas within the mesquite country failed to bloom at all. Just what the cause was is hard to say. The soil is the same, the rainfall was similar, and the age of the trees the same. The only explanation that has been suggested is that these trees bloomed heavily last year.

A questionnaire answered by several hundred beekeepers shows that this year's mesquite ranks first in yield of honey and horsemint second. Last year the reverse was true. Cotton, however, may rival mesquite. It will be October before I can report on cotton.

Prof. S. W. Bilsing and Dr. M. C. Tanquary, who will have charge of the entomology work at the short course at the A. & M. College, July 25-29, have the arrangements made for the Beekeepers' School July 26-28. A notable feature of this school will be the number of auto trains that will bring the beekeepers to the school. One train of ten autos will go from San Antonio, one of like size from Palestine, and one from Temple. A large number of smaller groups are being planned from various beekeeping centers. It is hoped that these overland trips of well-decorated cars will stimulate the interest in beekeeping and the sale of honey.

The influence which the bees have on the beekeepers is rather remarkable. We often wonder and try to explain why the bees rush around the hive, get out and "wash-board," and do other of their strange actions. We wonder what the bees get out of our performances. A month ago we were rushing from hive to hive putting in feed or making increase, and now we are wildly running from yard to yard, jerking off supers and otherwise mussing up the colonies. What do you suppose the bees discuss in their trade papers?

Very little attention is paid to the smaller plants, growing in swamps or water, as a source of nectar. In 1914 I found water willow, *Dianthera americana*, to be a very important factor in the white clover honey crop of many sections of Missouri. Because of its habit of growing in the water it is not affected by dry weather and has a continuous daily honey flow. Here in Texas, even tho the climate is supposed to be semi-arid, there are swamps, rivers, water holes, and "tanks" all abounding in nectar-bearing plants which bloom during nine months in the year. Pond lily honey has been reported in large quantities. The blue-flowered pickerel weed, *Pontederia cordata*, the arrowhead *Alisma* and *Sagittaria*, several species, water purslane, *Ludwigia* sps., and a number of others add a very large amount to the Texas honey flow.

The experimental queen-yard belonging to the State Experimental Station is producing a fine lot of queens. This yard was established last year and is producing more and better results than were expected. Under the guidance of L. R. Watson, State Apiculturist, and A. H. Alex, queen-breeder, the yard is delivering the queens almost as fast as they are ordered. H. B. Parks.

San Antonio, Tex.

BEE KEEPING
EXTENSION DEPT MISS. A.&M. COLLEGE
ASK HOW TO DOUBLE THE INCOME FROM YOUR APIARY
EKEEPING
TERATURE

Educational exhibit by the extension division of the Mississippi Agricultural College, at the Mississippi State Fair.

HEADS OF GRAIN FROM DIFFERENT FIELDS

Several Timely Hints. Wait two days after removing the old queen before introducing ripe queen-cells. Fifteen days later look for eggs.

Bees that are to be united with another colony should have their queen killed two days previous.

Nail two pieces on the escape-board to guide bees to the escape; the super will be free of bees much sooner than without the guides.

The young virgin queen not long from her cell does the piping. Her note is higher than the queen quahking in her cell.

East Avon, N. Y. A. C. Gilbert.

* * *

Catching Queens With Tanglefoot. After having had considerable trouble in catching a queen to clip her wings I now get her legs tangled in honey to prevent her from chasing from one end to the other of the frame, which is very irritating to the bees. I have some honey in a small bottle ready to pour over her, and find it a very good and simple way to handle queens to clip their wings. Another advantage of covering them with honey is that it avoids leaving the scent on the fingers, and so assures their safety in placing them back on the frames.

Fall River, Mass. Delphis A. Lagasse.

* * *

Removing Escort Bees When Introducing. I do not know whether it ever occurred to you that escort bees with their queen may cause some disturbance when attempting to introduce. Rarely, indeed, have I ever seen an escort worker left even when the queen is accepted; so by removing them before introducing we eliminate that danger. With the success we have had in introducing queens without escorts is it not possible that the bees will be more ready to accept a queen if there are no strangers with her? E. J. Ladd.

Portland, Ore.

* * *

Value of Shade for Bees. If the beekeeper only knew what it costs to leave his bees out in the hot summer sun without shade-boards, also the risk he runs from the combs melting down, he would use shade-boards on every hive.

I make my shade-boards from four shakes bound at each end and in the middle by lath.

Only a few years ago thousands of colonies of bees were destroyed in southern California from heat, and beekeepers should be prepared to meet this condition at any time, for Nature has a way of repeating herself every few years. A. E. Lusher.

Pomona, Calif.

Requeening With Virgin Queens. Two years ago, during the honey flow I killed my old queens in the afternoon, smoked in young ones about dusk, and had 80 per cent accepted. The past season the flow was very light, and I tried the same method, but it was almost an utter failure. I noticed in Gleanings a method in which the queen was caged on top of the brood-frames for 24 hours, then removed, and a young queen put in the same place, with the cage plugged with candy. I tried this method for the remainder of the season and never had a failure. I used a wire cage, three-eighths of an inch thick, laid flat over a space between frames under the excluder. In some cases the bees built cells and capped them, the young queen laying all around them, but these were all destroyed by the bees before time to emerge. I shall certainly continue to use this method unless the bees act differently the coming season. Thomas Martin.

Wanstead, Ontario.

* * *

Simplified Management. My apiary of 56 colonies is located on the banks of the Canadian River six miles from where I live. Last year these colonies produced an average of 55 pounds per colony, so it will be seen that production here is not large but it is reasonably dependable. We give no winter protection, usually leave one deep super on with plenty of stores in it, and in the spring the hives are boiling over before the honey flow begins, which is from alfalfa and sweet clover. The alfalfa honey flow begins early in June and all is over by the middle of September.

In the spring as the bees need room we just add those deep supers and let them ramble. We clip all queens in the spring and visit the bees once or twice a week. When the season is over we extract once for all, this usually being done in October.

We sell all of the honey here in fruit jars and ten-pound friction pails.

Choctaw, Okla. Eugene Couch.

GLEANED BY ASKING

Geo. S. Demuth

QUESTION.—Is anyone so accomplished in in the handling of bees as to be immune from stings? Oliver M. Fisher.
Illinois.

Answer.—No. The careful operator who understands the behavior of bees in defense will receive fewer stings than the operator who is nervous or careless, or who is not acquainted with bee nature, but no one is immune from stings. While apparently the bees are no respecters of persons and will treat all operators alike if the operators behave in the same manner toward them, yet there is a difference in the way they treat different persons which cannot be explained by their actions or dress. Of two careful operators working side by side one may receive twice as many stings as the other during a day's work among the bees. Some think this is due to a difference in the odors emanating from their bodies.

WORK OF QUEENLESS COLONIES.

Question.—Do queenless colonies gather honey just as freely as queenright colonies?
South Dakota. E. T. Frey.

Answer.—Usually they do not gather with quite the same energy and sometimes queenless colonies become quite sluggish even during a good honey flow. The difference in the amount of honey stored by a queenless colony and a queenright colony of the same strength may not be noticeable when producing extracted honey, but it is much more noticeable when producing comb honey. Queenless colonies do not build comb readily and are inclined to store in the brood-chamber instead of in the supers.

INCREASE AND SURPLUS OF HONEY AT SAME TIME.

Question.—Since you do not advocate natural swarming, how may a beginner increase his number of colonies and get some surplus besides?
West Virginia. C. E. Thompson.

Answer.—Much depends upon the time of the main honey flow. Where it begins just as the colonies have built up to full gathering strength in the spring or early summer, increase cannot be made before or during the honey flow without interfering with the production of surplus honey, unless it is made from brood and young bees that come on too late to take part in gathering the crop. Thus in either natural or artificial swarming during a short honey flow increase can be made without a loss in the amount of surplus, if the parent colony is set at one side of the swarm for a week and then moved to a new location (see page 299, May issue), for when this is done only the youngest bees and the emerging brood are left in the parent colony. If the honey flow closes within two weeks these young bees in the parent colony would not have been able to do much toward increasing the surplus, if the division had not been made. Utilizing the same principle where the honey flow closes in July it is possible to divide colonies at the close of the honey flow, making two or more from each; but in this case it will be necessary to supply each division with stores, for there will not be enough honey in the hive at the close of the honey flow for two colonies. Colonies may be divided even as late as the first of August if each division is given an ample amount of honey. Where there is a fall flow, colonies divided at this time may be able to build up and secure enough honey for winter, but otherwise it will be necessary to leave each division five or six full frames of honey.

PARENT COLONY FAILS TO DEVELOP LAYING QUEEN.

Question.—I have had considerable trouble with the parent colony's failing to develop a laying queen after moving it to a new stand seven days after the swarm issued, as described on page 299, May issue of Gleanings. Could this be because the parent hive was moved away while the queen was out on her mating flight? D. E. Scott..
Tennessee.

Answer.—Since the bees usually swarm at about the time the first of the queen-cells are sealed, the young queens do not begin to emerge until seven or eight days after the issuing of the swarm. In addition to this the young queen does not go out on her mating flight until she is several days old. From this it will be seen that if all goes according to the normal schedule, there is no danger of any young queens being lost by moving the hives away on the seventh day. If the issuing of the prime swarm is delayed by adverse weather there is a possibility of some young queens being lost when the parent hive is moved on the seventh day; but in this case the beekeeper, knowing that swarming was delayed, should move the parent hive away a day or two earlier. Ordinarily there is but little if any danger of young queens being lost in this way. There are plenty of other ways by which young queens may be lost to explain your trouble in this respect.

AMOUNT OF CARBON BISULPHIDE NEEDED.

Question.—How much bisulphide of carbon should be used on each pile of five hive-bodies of empty combs and how often? W. S. Chapel.
Vermont.

Answer.—About two ounces should be ample for five ten-frame standard hive-bodies, provided they are so piled that the gas from the carbon bisulphide cannot readily escape. It should be remembered that, as carbon bisulphide evaporates, it forms a gas that is heavier than air. The liquid should therefore be in a shallow pan or saucer placed in an empty super on top of the pile of hive-bodies. A cover should be placed on top of the empty super, and the whole pile should be made as tight as possible to confine the gas. A second treatment two weeks later to kill any larvae that may have hatched from eggs that were present at the time of the first treatment should be sufficient for the safety of the combs, provided they are kept where moths cannot get at them. You can have these combs taken care of by the bees without the necessity of any fumigation by tiering the hive-bodies filled with combs over strong colonies. One strong colony can take care of five or six sets of combs or even more.

SACBROOD AND THE SO-CALLED PICKLED BROOD.

Question.—Are sacbrood and pickled brood one and the same thing? H. B. Shollenberger.
Pennsylvania.

Answer.—Sacbrood is the name now applied to the brood disease formerly called by some pickled brood. The term sacbrood suggests the saclike appearance of many of the dead larvae in this disease. It is not so destructive as American foul brood or European foul brood, and it is somewhat transient in character usually disappearing of its own accord, especially after midsummer. Altho this disease sometimes so weakens the colony in the spring that it is unable to store a surplus of honey, it is usually not necessary to give any treatment other than to see that such colonies have a good queen and sufficient stores.

COST OF EXTRACTING HONEY.

Question.—What would you consider a fair price to charge for extracting a neighbor's honey if he helps me take it off the hives?
Pennsylvania. Robert L. Cooke.

Answer.—If there is only a small amount of honey to extract one cent per pound is probably a fair price, for there would be some loss of time in preparing for the work and cleaning up afterward. When a large amount is to be extracted and a large power-extractor is used, it could be done for less.

SUPERS AND AMERICAN FOUL BROOD.

Question.—Would it be safe to use supers of sections filled with full sheets of foundation with here and there a section of drawn comb but empty that had been on a colony having American foul brood? C. W. Horner.

Answer.—No, it would not be safe; but, in actual practice, a careful beekeeper could do this without many cases of a recurrence of the disease.

DISINFECTING HIVES BY BOILING IN SALT WATER.

Question.—Is it safe to disinfect hives that have housed colonies having American foul brood, by boiling them in a strong solution of salter water?
New Mexico. J. H. Sinclair.

Answer.—Yes, if they are boiled long enough to kill the spores of the disease. The addition of salt should not be necessary, however, for the heat will destroy these spores if kept at the boiling point for a half hour. The salt solution would have a higher boiling point than pure water, which would reduce the time necessary to kill all the spores. Perhaps 15 minutes would be ample. A serious objection to boiling the hives is that it causes the wood to warp and twist badly. Flaming the inside of the hives lightly with a painter's torch will render them safe to use again. After all, the important thing is to have the hives well cleaned on the inside so there is no possibility of even the smallest drop of honey on them.

REMEDY FOR MOTHS.

Question.—My bees have moths in their combs. What can I do? Marion Rowe.
Texas.

Answer.—If you keep Italian bees and see that the colonies do not become weakened by lack of stores or disease, the moths can not harm them. Moths are not able to breed in the combs of strong colonies of Italian bees, but they quickly take possession of any combs not protected by bees. When moth larvae are found in the hives, it is advisable to find out what has caused the colony to become weak, for sometimes one of the brood diseases gets a start in the apiary without the beekeeper's suspecting any trouble until the moths begin to take possession of the combs. For this reason you should examine the brood carefully in these colonies to see if any of it is dead or discolored, disease being thus indicated.

QUEENS LAY SEVERAL EGGS IN ONE CELL.

Question.—This spring I found some of my queens laid two eggs in many of the cells, and in one cell I found three eggs. Are these queens all right? H. V. Howard.
Wisconsin.

Answer.—These queens are probably all right. It is not unusual for a good prolific queen, whose colony is not strong enough to take care of a large amount of brood, to go back over her work and lay a second or third egg in many of the cells. As soon as there are enough bees to cover more brood such queens again lay regularly. It is not difficult to tell from the position of the eggs whether the queen is normal. Drone-laying queens and laying workers sometimes lay many eggs in a cell but place them in irregular positions, sometimes even on the walls of the cells instead of on the base.

DISINFECTING HIVES WITH KEROSENE.

Question.Is it possible to disinfect hives by painting them on the inside with kerosene to kill the spores of American foul brood? K. Hurst.
Oklahoma.

Answer.—Kerosene is not used as a germicide and would probably not destroy the spores of American foul brood altho it might tend to dissolve the external covering, thus weakening their resistance. Until someone definitely proves by experiment that these spores are actually destroyed by a coating of kerosene it will be advisable to use some other method. If American foul brood does not reappear in hives that have been treated with kerosene, this can not be taken as proof that the spores have been killed; for if the walls of the hive are absolutely free from honey, there should not be many cases of recurrence of the disease even when the hives are not treated. The application of heat, either by live steam or by lightly scorching the inner walls of the hives, is doubtless safer than painting them with kerosene.

BEES, MEN AND THINGS

(You may find it here)

THE surplus honey season is over here. We have one-third of a crop generally. Many have taken the honey before ripe. I have not extracted much, rather let bees ripen it first."—N. E. France, Grant County, Wis.

"The crop is a practical failure here so far. It seems as tho the bees go down, and there is a shortage of bees. We had big losses in the flood. We may get honey later, but prospects are not very good."—Bert W. Hopper, Otero County, Colo.

"I am 69 years of age—69 years young—and have never seen the bees in such poor condition in all my life. I have the fear that not enough honey will be secured to carry them thru the coming winter."—T. K. Massie, Mercer County, W. Va.

"The sale of honey here is just like in America. I had 11,000 pounds and sold it on the local market for 2550 crowns ($433.50), and all was sold before Christmas. Other beekeepers who did not have more than half as much sold at a much lower price and have not all sold yet."—Anna Sommer, Roune, Bomholm, Denmark.

"We have had a very dry season and honey flow. Bees have wintered over fairly well and have had excessive swarming in well-kept apiaries. All this undoubtedly reduced the honey yield very considerably. My own hives are going to average close to 150 pounds of extracted honey per colony, but I have not allowed them to swarm."—J. R. Helper, Strafford County, N. H.

"A few are extracting honey that really ought to be left for winter stores. The unusual late May rains came too late to get the benefit of the sages. The most of the honey coming in is from wild flowers revived from the May rains. A part of my bees have stores for winter, the balance I shall move to the beans. The beans are my only source for surplus, as the honey gathered at the Piru Range I will keep for winter stores."—M. H. Mendleson, Ventura County, Calif.

"The honey production in Tennessee this year is very unusual. Around Knoxville we had an unusually good honey year. The fruit bloom was cut off some by cold weather, but the clover has been unusually good with climatic conditions right to hold it over a long blooming period. In middle Tennessee, however, conditions are quite different. They have had an extended dry period and their bees are doing very poorly. Generally over east Tennessee the bees have done well this year."—G. M. Bentley, Knox County, Tenn.

"Weather has been very dry here, the nearest a dearth this county ever knew. Recent rains have started the nectar coming in. We may make a little better than a half crop, if the weather is favorable from now on. There is no fall flow here. Alsike clover is the main dependence."—O. B. Griffin, Aroostock County, Maine.

"We are having the poorest season here in years."—Geo. B. Howe, Jefferson County, N. Y.

"Weather conditions have changed some, and there is still a chance of getting a normal crop for the entire season. White clover is coming in bloom again and conditions look favorable.—O. J. Spohn, Westchester County, N. Y.

"There is no surplus so far in this locality, and unless we have abundant rain and a fall run, we will not have enough winter stores. Everything is suffering from drought."—Gus Dittmer, Eau Claire County, Wis.

"The first flow of honey, which usually starts about the fifteenth of June, has absolutely failed this year due to unusual early rains and early June frost. Bees are getting just enough to rear brood. Crop will undoubtedly be about 50% of normal."—T. V. Damon, Lyon County. Nev.

"The indications at this time (June 22) seem to point to a very heavy yield of honey for this section of Beedom. A ready sale for all the honey that can be secured is assured here."—E. I. Smith, Warren County, Ky.

"My six colonies this year produced 765 pounds of white clover honey. My best colony gave 192 sections. This is my first real good crop, and it is due partly to the abundant clover, but largely to Mr. Demuth's recent articles. They were just what I needed."—Lide Martin, Brown County, O.

"My family and friends prefer honey on grapefruit instead of sugar. There is no particular rule about it, just use it to taste. Oranges cut up and put back in the half peel with a little dash of honey make a fine dessert."—Ira J. Hashell, Essex County, Mass.

"I came across some combs I put in foundation for last year, with horizontal wiring and then four halves of Miller splints vertically on the foundation. The appearance of these combs was or is so fine that I concluded hereafter to put up all my frames with foundation in this way in preference to any diagonal or perpendicular wiring."—Chas. Reynders, Bradford County, Pa.

JUST NEWS

Editors

THE Eastern Massachusetts Society of Beekeepers will hold its field meeting on August 6 in Dedham, Mass. Dr. E. F. Phillips of the Bureau of Entomology, Washington, D. C., is to be the principal speaker at this meeting.

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The Ohio State Beekeepers' Association will hold a summer meeting at Ashtabula on August 20.

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The summer meeting of the Michigan State Beekeepers' Association will be held at Alpena, Michigan, August 3 and 4.

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The annual meeting of the New Hampshire Beekeepers' Association is to be held at Durham at the State College on August 17. This association has about 70 members

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The beekeepers of northwestern Ohio will hold a field meet at Scott, O., in the apiaries of F. W. Summerfield on August 11. Mr. Summerfield will show his method of requeening without dequeening at this meeting.

* * *

The Beekeeping Course is to be reinstated in the Massachusetts Agricultural College at Amherst, Mass., this course having been suspended when Dr. Burton N. Gates left that institution several years ago. Norman E. Phillips, brother of Dr. E. F. Phillips, is to have charge of this course.

* * *

The Canadian Horticulturist and Beekeeper has been changed in form and is now "The Beekeeper." Commencing with the July number it will be a twelve-page journal issued once in two months. It is to be published in Petersboro, Ont., instead of in Toronto as formerly.

* * *

Something like 1,500 colonies of bees were lost in the Arkansas Valley in Colorado by the floods which swept Pueblo early in June. At least one beekeeper, W. A. Dolsen, lost his life in this flood, his body having been swept down with the wreckage. Bert W. Hopper lost 500 colonies, together with all the equipment.

* * *

The Fordney tariff bill, which was passed in the House on July 21, provides a tariff of 2½ cents per pound on honey imported into the United States from foreign countries instead of 10 cents per gallon as under the present tariff law. The bill must now go to the Senate where, it is anticipated, it will meet with long discussion, for passage in the fall.

The third annual summer meeting and camp of the Wisconsin State Beekeepers' Association will be held at Chippewa Falls August 15 to 20.

The American Honey Producers' League has submitted the following news item concerning the League activities: Prof. H. F. Wilson has completed a tentative schedule of the State meetings and will shortly publish the list for the benefit of those interested. H. L. McMurry, Madison, Wisconsin, chairman of the committee to co-operate with the National Horticultural Society in their national tree-planting campaign, asks that all interested send him the names of the trees which are nectar-bearing and also good shade trees which will grow in their vicinity. Dr. E. F. Phillips, Chairman of the Research Committee, reports that some investigations have been made on the subject of the use of honey in candy and that the results will be published soon. The first advertising of the League will appear in Good Housekeeping issue for September. It will show a sketch of a comb of honey on the breakfast table, with biscuits and milk to whet the appetite of the reader. At the same time the wholesale grocers will receive a circular, and articles will appear in newspapers thruout the country on the use of honey as a food.

* * *

Following is a partial list of important fairs to be held this summer and fall. A further list will be published next month.

Fair.	Location.	Date	1920 Prizes.	1921 Prizes.
Calif. State,	Sacramento,	Sep. 3-11	$144.00	$144.00
Connecticut,	Hartford,	Sep. 5-9. .	489.25	499.00
Southeastern,	Atlanta,	Oct. 15-25	300.00	300.00
Ill. State,	Springfield,	Aug. 19-27	589.00	589.00
Ill-Ind.,	Danville, Ill.,	Aug.29-Sep.3	24.00	24.00
Ind. State,	Indianapolis,	Sep. 5-11	169.00	159.00
Ky. State,	Louisville,	Sep. 11-17	49.00	49.00
Ia. State,	Des Moines,	Aug.24-Sep.2	497.00	650.00
Kansas Free,	Topeka,	Sep. 12-17	200.00	200.00
Kan. State,	Hutchinson,	Sep.17-23	363.50	444.50
La. State,	Shreveport,	Oct.27-Nov.6	100.00	150.00
New England,	Worcester,	Sep. 2-6	*	193.50
Michigan State,	Detroit,	Sep.2-11	Co-op.	Co-op.
West Mich.,	Gr. R'pids,	Sep. 19-23	595.00	589.00
Minn. State,	Hamline,	Sep. 3-10	1110.00	1233.00
Mo. Cent. Exp.,	Sedalia,	Aug.8-13	151.00	300.00
Nebraska State,	Lincoln,	Sep. 4-9	447.00	445.00
Inter-St.,	Trenton, N.J.,	Sep.26-30	33.00	205.00
Ohio St.,	Columbus,	Aug.29-Sep.3	Co-op.	Co-op.
Ok. State,	Okla. City,	Sep.24-Oct.1	280.00	280.00
Oregon State,	Salem,	Sep.26-Oct.1	129.00	129.00
Erie Expo.,	Erie, Pa.,	Aug. 22-27	*	51.00
S. Car. State,	Columbia,	Oct.24-28	*	5.25
Inter-State,	Chat'ga, Tenn.,	Oct.1-8	103.00	103.00
Tenn. State,	Nashville,	Sep. 17-24	301.00	301.00
Texas State Fair,	Dallas,	Oct.8-23	423.00	442.00
Virginia State,	Richmond,	Oct.3-13	66.00	61.00
Inter-St.,	Spokane, Wash.,	Sep.5-10	250.00	295.00
Wis. State,	W. Allis,	Aug.29-Sep.3	1153.00	1497.00
N. Wis.,	Chippewa Falls,	Sep. 12-16	*	43.00
Van. Exh.,	Vanc'r, B.C.,	Aug. 15-20	208.00	167.00
Western,	London, Ont.,	Sep. 10-17		170.00

* No record.

TALKS TO BEGINNERS

Geo. S. Demuth

THRUOUT the greater portion of the United States there is usually but little, if any, honey stored in the hives during the fore part of August. Even where there is an almost continuous honey flow from different sources thruout the summer, there is often a break in late July and early August, tho there are some exceptions to this. In the clover region, white clover and alsike clover may continue to bloom this month if there have been sufficient rains, but it is only during exceptional years that it continues to yield nectar in paying quantities.

In many localities the main honey flow ceases in June or July and there is no later honey flow that is sufficient in amount to furnish surplus honey. In other localities, such as the strictly buckwheat region of New York, Pennsylvania, and West Virginia, the main honey flow does not begin until some time this month, the earlier honey flows not being sufficient in amount to be depended upon for surplus. Still other localities furnish both an early honey flow and a late honey flow, usually with a break of a few weeks between, the break in most cases being in late July and early August. On swampy land and in river bottoms there are sometimes enough fall flowers that come into bloom usually in August to make it necessary to give the bees more room in which to store the honey. During occasional wet seasons there may be enough fall flowers, such as heartsease and aster, even on the uplands to furnish surplus honey.

In Canada the yield from fireweed is frequently at its best during this month, and in the irrigated portions of the Northwest alfalfa and sweet clover usually continue to yield during August. But for most locations within the United States August brings either a dearth or a scarcity of nectar, especially during a hot and dry summer, and the beekeeper must make his plans accordingly.

Comb-Honey Supers Removed During Dearth.

Too often the comb-honey supers that are not filled with honey during the early honey flow are left on the hives all summer, with the hope that the bees will fill them later. If any are on the hives at this time, they should be taken off at once unless the bees are still storing honey in them, for if they are left on the hives during a dearth of nectar in August for even a week the sections and foundation will be badly damaged by the bees gnawing the foundation and varnishing over both the foundation and the sections with propolis. In some localities so much propolis is gathered that both sections and foundation are ruined in this way. Since most beekeepers who have but a few colonies are producers of comb honey, thousands and thousands of sections and sheets of foundation are ruined in this way every year.

But the loss does not stop here. In many cases these sections are put back on the hives the next season, and since the gnawed and propolized foundation is not acceptable to the bees, the colony may loaf or swarm rather than build combs in them, thus resulting in the loss of the crop. Even if such propolized sections are finally filled the next season, the honey can not be sold as first grade on account of the badly stained sections.

If these supers do not contain any honey, it is not necessary that they be emptied of bees before they are taken off; but they may be removed, bees and all, and by standing the supers on end, leaning them against the side of the hive, the bees will leave them within an hour or two. This should not be done if any of the sections contain even a small amount of honey, for to do so would be almost sure to start the bees robbing. Supers which contain some honey should be taken off by means of the bee-escape, or the bees should be driven out by smoke.

Even in those locations where there is a fall flow, usually beginning some time this month, it is not best to leave the sections on the hives during the interval between the early honey flow and the fall honey flow. They should be taken off and stored in a warm dry room or attic until the fall flow begins when they may be put back on the hives if needed. If no fall flow is expected the unfinished sections which contain some honey can be sorted into different grades. Those which contain less than a half pound of honey can be saved to feed the bees later; and those which contain a half pound or more can be used at home or sold as culls. All comb-honey supers should be carefully piled so that mice can not get into them.

Extracting Early Gathered Honey Before the Fall Flow.

If extracted honey is being produced it should be extracted before any of the fall flowers begin to bloom, to prevent the mixing of the fall honey, which is usually amber or dark in color, with the earlier gathered honey which in most northern locations is a lighter-colored honey. Sometimes the early honey is not fully ripened before the beginning of the fall honey flow, in which case it may be necessary to leave the combs which are not sealed, extracting only from combs which are mostly sealed, the unripe honey thus being left to be mixed with the fall honey.

The process of extracting or the handling of the sections of comb honey should be done in a room which is well screened, having no openings thru which robber bees can enter. After the honey is extracted the empty combs should be put back into the supers and set back on the hives so the bees can clean up the combs and protect them from moths. While the bees will usually store some honey back in the combs when this is done, it is a method which a beginner can safely use. The combs should be given to the bees in the evening after they have quit flying for the day.

Preparation for a Dearth of Nectar.

The beginner should begin now to look forward to having the colonies in the best possible condition for winter. Much depends upon what happens within the hive from the middle of August until the first of October and the fate of the colony during the winter is determined largely before winter begins. To have good colonies for winter it is not necessary that they be booming strong now, provided they have the means of building up to normal strength for winter. The workers that make up the colony the first of August are not the ones that will make up the winter colony. The present workers will all be dead before winter begins, and the winter bees are yet to be reared. In fact, a good two-frame nucleus can be built up to a normal colony for winter even after the middle of August, if it has a good queen and plenty of food for rearing brood. On the other hand, colonies that are now so strong that there is not room for all the bees within the hive after the supers have been taken off, may be so reduced by the first of October that they are worthless if a normal amount of brood-rearing is not carried on in the meantime. The two things which most frequently prevent normal brood-rearing during August and September are a dearth or scarcity of nectar, together with too little honey left in the hives at the close of the season, and a poor queen or queenlessness.

The beginner who produces extracted honey will be tempted to extract all of the honey from the supers, expecting the bees to have enough in the brood-chamber for their fall and winter needs. Too often if there is no fall flow, the amount that is left in the brood-chamber now is not enough even for the needs of the colonies during the remainder of the summer and the fall, to say nothing of their winter stores. Even when comb honey is produced the bees sometimes put so much of their honey into the supers that there is not enough left in the brood-chamber to last until winter, unless they are able to gather considerable nectar during the fall, tho comb-honey colonnies usually have much more honey in the brood-chamber at the close of the honey flow than extracted-honey colonies.

The only safe thing for the beginner to do, unless he is located where the fall honey flow is quite certain, is to leave with the bees enough honey at the close of the early honey flow to supply their needs thru a possible dearth of nectar from now on. When producing extracted honey at least five full frames of honey should be left in the upper story in addition to that in the brood-chamber. When producing comb honey this is usually not necessary, but it is well to have two or three extra combs of honey for each colony, to be given later if needed. Some comb-honey producers arrange to have certain colonies store these extra combs of honey in an upper story during the early honey flow.

In addition to an abundance of stores, each colony should have a good queen at least after the middle of August, for a poor queen or an old queen can not be expected to lay enough eggs during the fall to produce a good colony for winter when nectar is scarce, even when plenty of honey is left in the hives. If colonies are requeened to improve the stock or to supplant old and failing queens, this should be done in time for the young queen to begin to lay soon after the middle of the month, in order that there shall be time to rear plenty of young bees for winter.

To find and kill the old queen in order to introduce a young queen at this season is a rather difficult undertaking for a beginner, especially if there is a dearth of nectar and the bees are blacks or hybrids. Under such conditions it may be best either to ask a neighboring beekeeper who has had more experience to help find the old queen, or to wait until later in the month when there may be more nectar available. Great care should be taken in all requeening operations to prevent robbing, for if robbing is started the new queen is more liable to be lost in introducing. The printed directions for introducing sent out by the queen-breeder should be strictly followed when introducing queens.

Preparation for a Fall Honey Flow.

Where a fall honey flow is reasonably certain it is not necessary to leave so much honey in the hives at the close of the early honey flow. For extracted honey, the extracting combs having been put back on the hives after being emptied, the colonies are ready at any time for a fall honey flow, but for comb-honey the supers should not be put back on the hives until the fall flow actually begins in earnest and the bees begin to elongate the cells in the upper portion of the brood-combs as at the beginning of the early honey flow. Unless the fall honey flow is rapid it will be better not to put on comb-honey supers. It would be much better, in such cases, to give an upper story of empty combs and let the bees fill these; then, if not too far north where the winters are severe, leave the extra story of honey on the hive all winter, and note how rapidly colonies so abundantly supplied with stores will build up next spring.

OUR HOMES

A. I. ROOT

Ye have heard that it was said by them of old time, Thou shalt not commit adultery.—MATT. 5:27.

But I say unto you that whosoever looketh on a woman to lust after her hath committed adultery with her already in his heart.—MATT. 5:28.

And if thy right eye offend thee, pluck it out and cast it from thee; for it is profitable for thee that one of thy members should perish, and not that thy whole body should be cast into hell.—MATT. 5:29.

FORTY-SIX years ago, shortly after I announced in public my stand for the Lord Jesus Christ first and for A. I. Root second, I started in this journal a department headed Our Homes. When I undertook to carry it out I did not know but I should be called upon to give up bee culture and and the new bee journal; but when I prayed over it the answer seemed to be to go ahead with bees and the journal, but to set aside a department for the special work whereunto I should be called and *guided* and *directed.* As I looked over humanity it seemed to me then that making the *homes* more pure and sacred was what the great wide world most needed; and I still think so as I look back, over the years, and consider poor sinful humanity. Intemperance then seemed to be the great arch enemy of the home; and you know how I have fought it all of these 46 years, and how my prayers are just now being answered. Praise the Lord for recent victories. Well, what comes next to intemperance, as a weapon for the arch enemy of all that is good and pure? Let me digress a little.

For many years we have heard about "boy preachers," and I think I have heard some *recent* mention of a boy preacher who was, or is now, doing a great work. Perhaps people will listen to him because he *is* a boy, and this may be one reason why I listened and laughed (may God forgive me) because somebody told me that a boy passing my place of business was a "preacher." I went to hear him largely *because* he was a boy; and that boy (bless his memory) was, thru God's providence, the means of my making the greatest discovery of my life—the discovery that *I* was a *sinner*, and enabling me to get in touch with "the Lamb of God that taketh away the sin of the world."

The girl preacher.

With the above preface, dear friends, I wish to announce to you "the girl preacher," and that the time has come when we not only have boy preachers but *girl* preachers; and right alongside of this statement I wish to give you a glimpse of the first girl preacher I ever heard of; and as to whether I have got it right, and that she really is a *preacher*, I leave it with you to decide when you have heard her sermon. By the way, I am not really sure at this moment that she is a follower of the Lord Jesus Christ; but even if she is not, I feel that God has called her to take up a most important work; and I do not know but I should say it is *the* most important since prohibition has been accomplished and the law is being enforced. I found her picture and her sermon in the Cleveland Plain Dealer some weeks ago. The article was copyrighted by the McClure Newspaper Syndicate, and they have furnished me the two pictures. Below is the sermon, or what I have been glad to call a sermon, by the girl preacher:

THROUGH EYES OF A WOMAN.

By Jane Doe.

THE MARRIED MAN AND YOU.

He may be your chief; he may be your best friend's husband; he may be the man who gives you your singing or French lessons; he may be the man you meet on the "L" every day and who is so attentive and good looking. It really doesn't matter who he is if he has a wife.

Steer clear of him.

Many and many a girl is frittering away her opportunities and perhaps her best years on a love affair with a man who has only about one chance in a hundred to marry her, and even if that chance came would probably fight shy and seek other pastures new.

The married man who philanders is not the sort of pal for any girl.

If he has so little loyalty to his wife, if he can forget his obligations so lightly and fluff with any girl who gives him half the chance, you can make up your mind to the fact that there will be no respect left at all for her who so willingly philanders with him.

As she gives her sermon, "The Married Man and You."

> If you are on sentimental relations with a married man, you are asking for trouble, and you will get al lthat is coming to you—without fail.
>
> Moreover, you are not only harming your own self, your own freshness, your own reputation, all of which should be so precious to you, but you may bring lifelong misery into the other woman's heart.
>
> It is a great thing for any girl to be able to look back on her life and say: "I never poached on any other woman's preserves, and I never had a love-affair with any one I couldn't take home to mother and father."
>
> Besides, there will come a time, dear girl, when you will fall in love—sanely, cleanly, and really and truly.
>
> And there will also come a time when you will want to tell your lover everything; you will want to dig up all that part of your life which passed before you knew him.
>
> And the part about the married man whom you will then regard with contempt and loathing will be the hardest and most miserable to tell, and you'll feel you'd give anything on earth to have had that episode erased from your life's slate.
>
> There is something about an affair with a married man which is unspeakably degrading and cheapening. You will never feel the same girl after it.
>
> When a man tries to play on your sympathies by telling you about his cold-blooded, unsympathetic and non-understanding wife, and that only your sweet little heart was destined to beat in unison with his, hit out straight from the shoulder and tell him he has proved himself worthless of either love or understanding.
>
> Married men sometimes get tired of their wives. But don't let them console themselves with you.
>
> JANE DOE.
>
> (Copyright, 1921, by the McClure Newspaper Syndicate.)

If you think I am exaggerating the importance of the above, let me call your attention to the number of divorces reported in every daily paper. Heretofore many divorces have come about because of strong drink; and we hope and pray that we may now find the number of homes broken up in this way greatly lessened. It would fill this journal if I were to tell you even briefly of the homes I have known to be broken up; and many times the whole trouble started by some trifling piece of folly.

Just shortly after I saw the above in the Plain Dealer there was an account of a murder. A young girl on the witness stand admitted that the defendant did "playfully hug" her once; and in trying to make it appear that there was nothing particularly *wrong* about it she said they were just "cutting up;" and this cutting up as it is called resulted in jealousy and murder. We are told that Satan goes about as a roaring lion seeking whom he may devour, and also that he goes about as an angel of light. The great wide world does not seem to know, that Satan traps a man in this way exactly as he traps him with strong drinks, cigarettes, or things of that sort, until the poor wretch actually thinks he can never be happy nor even *live* unless he can have some other woman or girl than the good wife who legally and before God belongs to him. I shall have to confess that I never noticed until I started this Home paper that what the dear Savior said about plucking out an eye follows *right after* what he says about adultery. And, my good friend, if you are a married man you had *far better* lose an *eye* or *your right hand*, than to get into Satan's toils in this way.

I think I once advised in these Home papers that every man, when he is of the right age, should be married—that is, unless there is some serious obstacle in the way; and in the same way every woman of the proper age should be a married woman, and, if God permits, become a mother—a lawful mother before God and man. Here is a statement which I found this morning in the same Plain Dealer I am quoting from:

> This statement was made today by William B. Joyce, president of the National Surety Co., whose business it is to insure men's honesty:
>
> "Married men, because of the responsibility of their families, are more honest than bachelors in the ratio of about 6 to 1."

I never thought of that before; but since it has been brought to my mind, I believe that, even if the above *is* somewhat of an exaggeration, there is a lot of truth in it. When I get acquainted with a beekeeper or a scientist or any one else who has done a good work for humanity I want to know right away whether he is a married man, and, next, I want to know, if not too impertinent, if he stands before the world a professing Christian. Our girl preacher intimates that there may be one chance in a hundred for a silly girl, trifling with some married man, to succeed in making him her husband. The only way in which such a thing can happen legally would be as the result of the death (or divorce) of his wife. The Savior says in one of his texts, that "whosoever looketh on a woman to lust after her hath committed adultery with her already in his heart," altho he may not be exactly a criminal. But, my good friends, just consider seriously of even looking forward to the possibility that your neighbor's wife may die; and, again, think of a married man who may even let the possibility of his wife's death come into his mind in order that he may legally marry the silly girl who permits his advances. Would not that be almost akin to committing *murder* in your own heart? Let me give you a brief sketch.

A certain doctor was getting to be pretty well acquainted with a widow's daughter. When he went out to visit a patient he sometimes took this daughter along. His own wife was a most beautiful Christian woman; but in spite of all the doctor's skill she sickened and died. (May it not have been of a broken heart?) In due time this doctor married the widow's daughter; and altho it was not very long after the death of his wife, he could not, or at least he did not, conceal the exuberance of his joy that he could *now* have this beautiful girl for his legal wife. Did they "live together happily ever after," as the story-books have it? Not much. They were soon quarreling. They were not at all suited to each other.

In the same neighborhood was a railroad

man. His duties were such that he could not get around home to meet his charming young wife oftener than once in two or three weeks. In the course of time this railroader's wife had to call a physician. When she was convalescent, in order to give her ''fresh air,'' etc., the doctor took *her* out in his buggy. People began to talk. The railroad man came home, and he and the doctor accidentally met each other on the street; and finally the neighbors, when they saw the two had become excited, saw also two revolvers produced; and had it not been for their interference a tragedy would probably have ensued. Two divorces followed, and *once more* the doctor had a new occupant in his home. There was such talk, however, about it, that the doctor evidently considered it best to mend his ways. I do not know whether he became a follower of the Lord Jesus Christ, or not, before he died.

Just one more incident:

In a certain town in Ohio there was a wealthy manufacturer, but he openly professed skepticism and infidelity, both in public and in print. He would stop his business at almost any time to criticise God's holy word. During one of the church revivals his case was mentioned, and a committee was appointed, not only to pray for him but to labor with him in regard to the harm he was doing the community by his example. Among the committee was a Christian woman who seemed to have remarkable skill in winning souls to Christ. She was appointed to go and call on this skeptic and see if she could not do him some good. Now, as soon as I knew of it I said the church was very unwise. This skeptic was well read. In many respects he was a man of great ability. Instead of this good woman winning him over to *her* religion he won her over to *his* hopeless infidelity and unbelief. Altho he was an elderly man with a good-sized family of eminently respectable men and women, two divorces followed and the two were married.

Years ago I protested about having a business man and his stenographer shut up together in a little room by themselves; and you have only to go over the daily papers to see how many divorces come about now, because of somebody's ''stenographer.'' A certain banker was doing quite a business. He became so much infatuated with his stenographer that there was talk that it threatened to break up his home. A minister was called in, and *I* was consulted in regard to the matter. When I declared that the stenographer should leave in an instant, even if the banker's wife *was* unreasonable, the minister replied something like this:

''Mr. Root, that stenographer is the life of the bank. She has had more to do in building it up and enlarging the business than the banker himself. It might be the ruin of the institution if she were sent away.''

What do you think I said? Something like this:

''Then let the institution go to ruin. In a case like this, dollars and cents should not count. If this woman's presence in the bank was of more consequence than the happiness of the wife and mother, let the banker go somewhere else or do something else, no matter what happens to finances.''

My advice was not taken, and pretty soon there was a divorce, and the banker married the stenographer, and I think the banking business went ''down and out,'' shortly after. ''What God hath joined together, let not man put asunder,'' says the Savior.

I wish to call attention to the girl preacher's statement, ''There will also come a time when you will want to tell your lover everything.'' And I might go on and quote from the whole sermon in the same way. May God bless that bright message; and may it be read again and again and *considered*, by both, ''the married man and you.''

Please do not think from what I have said or from what the girl preacher has said about the ''married man and you'' that a married man or a girl should not be pleasant, courteous, and sociable; but both should be careful, and avoid the temptation to *discriminate*. The married man should treat all girls alike so far as circumstances will permit. There should be no special favorites. In the same way the young woman should be pleasant and agreeable to all married men alike. Let each keep constantly in mind that beautiful text written by one who fell so suddenly (and disastrously) by departing from the right road in regard to the things I have pointed out —David.

Search me, O God, and know my heart; try me, and know my thoughts; and see if there be any wicked way in me, and lead me in the way everlasting.—PSALM 139:23, 24.

"The dearest idol I have known,
Whate'er that idol be,
Help me to tear it from its throne,
And worship only thee."

Blueberries and Huckleberries Under Cultivation.

I have always, since early childhood, been interested in huckleberries—both the kind that grows in the swamps and the other sort that grows on high ground. I believe the latter used to be called ''blueberries.'' At various times during the past 50 years I have heard of attempts to grow one or both in the garden under cultivation, but I believe they have always been failures. Some years ago the *Rural New-Yorker* announced that a lady in New Jersey had discovered the reason of failure, which was that both huckleberries and blueberries must have an *acid* soil. They can not stand stable manure nor any soil containing lime. The paper stated further that she was achieving great success in a soil made up of rotten leaves and sand. The decaying leaves produce the sourness; and in order to keep up this sourness more leaves must be provided, and, as a matter of course, plenty of moisture. I think the statement was also made that certain parties from the Department at Washington were helping her in her work, and collecting specimens of the largest and finest berries to be found near swamps as well as on the dry land.

Well, something like a year ago I noticed in the Florida papers mention made at different times of cultivated blueberries in Florida. A nursery located at Oldsmar, near Tampa, advertised plants producing berries over half an inch in diameter, and which grew on bushes or trees from five to ten feet high. They also made the statement that one plant had produced a bushel of berries, and another one 21 quarts of berries at one picking. I submitted the statement to the Department of Agriculture, and they gave it as their opinion that the merits of the plant had been greatly exaggerated. This same nursery advertised half a dozen or more varieties. During the past winter I paid the nursery two visits. I saw plants in bloom so tall that I had to bend the tree down so I could get the perfume of the blossoms, and I carried home seven plants of different varieties, for which I paid $4.50. At the present writing, July 14, I am informed that only two plants of one variety are living. This is probably owing largely to neglect since I left May first, and also to a severe drouth during May and a part of June.

In June I had some correspondence with Miss Elizabeth White of New Jersey, the lady who first demonstrated that blueberries can be grown successfully under cultivation; and finally it was my pleasure to visit her plantation on July 7. As her location, Whitesbog, New Jersey, is not very far from where W. A. Selser of Philadelphia lives, he accompanied me. As his hearing is better than mine I submit below some notes that he took down.

> We reached Mount Holly at 9:05 a. m., where Harold Hornor met us in his automobile, and took us to his house, about a mile and a half from the station. After resting a few moments, Mr. Hornor drove us all around his sixty-acre fruit farm. He is the only fruit-grower in that part of New Jersey who has any fruit whatever. He has one of the best crops of apples and in all some 50 odd varieties.
>
> Mr. Hornor has about 90 colonies of bees on the lawn at his home and expects about 6,000 pounds of honey this year. Some of the hives are tiered up four and five stories high. He had all new queens introduced this spring, which is his custom, and he claims that he is the exception in getting an apple crop *because* of the quick fertilization of the apple blossoms by the bees.
>
> There is one orchardman in his State, who is planning to pay him $500 next year to have him place 100 colonies of bees in his orchard. This will be simply a rental, and Mr. Hornor will have the bees returned to his own place after the three weeks' blossom time is over. This shows the value of bees to agriculture.
>
> Mr. Root had a nap for about an hour, after which Mr. Hornor drove us for a trip about 16 miles to Joseph J. White, Inc., blueberry and cranberry plantation. Miss White is treasurer of the company. She, however, was unexpectedly called away, greatly to her regret, to attend a board meeting of the New Jersey State Institution for Feeble Minded, of which she is secretary. She delegated S. B. Hutton, who is her right-hand man (his address is Brown's Mills, N. J.), to explain everything in detail to Mr. Root and take him over the whole plantation.
>
> They have in all about 25 acres in blueberries, and a number of Italian pickers already in one of the fields. There are 15 acres in which the Federal Government is co-operating with Miss White along experimental lines to get the best results.
>
> A number of the bushes were enclosed with a contrivance consisting of an iron frame with white mosquito netting covering it. The bottom circular frame to which the mosquito netting was fastened, could be raised and the bushes easily examined. We were simply amazed at the largeness of the berries, and by actual measurement some of the berries were as big around as an ordinary copper cent. The clusters were nearly as large as a small fist and looked like immense clusters of grapes. Mr. Root's amazement knew no bounds.
>
> The soil two feet below the surface was wet and water could be obtained by digging 24 inches, but the surface was well cultivated and very fine, dry sand.
>
> They were sending their berries mostly to hotels in New York, also the seashore, and were getting 50 cents per quart wholesale for them, but could sell more than they could produce.
>
> Mr. Hutton went into detail with Mr. Root in reference to the proposition. Some have been grown from seed, others from cuttings and plants. The bushes do grow as high as six feet or more, but Mr. Hutton claims these must be put back and never allowed to grow so high as the fruit is not so good.
>
> July 7, 1921. W. A. Selser.

Sure enough, there were the blueberries I had heard so much about. I think there were about ten acres in bearing. The whole plantation was kept in beautiful trim. Not a weed of any sort was visible. You will see by measuring that a copper penny is just ¾ of an inch across, so the largest of these berries were equal to a fair-sized cherry. The birds were somewhat troublesome; and in order to give me a view of some of the best where no fruit had been gathered, a circular tent of mosquito netting was put over them. A hoop at the bottom could be raised to permit of picking, but no bird could enter it. The rows were eight feet apart, and the berry bushes were every four feet in a row.

The Department of Agriculture has succeeded in getting several improved varieties. Some of them came from seeds planted, and others by dividing the roots of desirable plants. It takes about three years to get fruit from a seedling. As it is with apples and many other fruits, the most of the seedlings are of no account. And then there is another serious trouble. You can not get blueberry cuttings to start in sand (or in a bottle) in the way the florist multiplies varieties. The expert mentioned said I could multiply my plants by taking a big thrifty plant and dividing it up or cutting it up, of course leaving a little root on each stalk. When I first found out about Miss White's work I wanted some plants; but I was told the supply was exhausted for the season. I was so urgent, however, that they shipped me two of their best varieties, carefully packed, at a cost of $5.00 each. Both are now growing finely. On July 12 one of these plants sent out a vigorous shoot that is now making a growth of something like 1½ inches a day. So the huckleberry, where it has things to suit it, is certainly a rapid grower. Now as to the quality.

At Mr. Hornor's, who is a nurseryman (or has been), they gave me a dish of beautiful peaches with sugar and cream; also another dish of red raspberries with sugar and cream; and a third one of the new huckleberries. When I tasted the peaches it occurred to me it would be a rather hard matter to get *any* fruit even its equal, and I said the same thing of the red raspberries. Then I tasted the huckleberries, and these *were* certainly ahead. I believe Miss White's cultivated blueberries are equal if not superior to any other fruit I ever tasted. The plant has no insect enemies; and I was greatly relieved when the expert informed me there should be no pruning—let every branch or sucker grow that will grow. As I looked around on that bright morning, especially at the fruit, I said to my attendant that I could almost say with the queen of Sheba, "Behold, the half was not told me."

The new blueberry produced by the Department of Agriculture by crossing some of the best wild varieties. We are obliged to reduce the photograph on account of a lack of room; but some of the best berries shown in the picture were really the size of good-sized cherries.

Now, there is no trouble about growing this beautiful fruit anywhere by providing rotten leaves or even rotten sawdust or peat from the swamp, with a certain admixture of sand (perhaps about ½); but be sure not to get in any lime, and keep packing leaves into the soil so as to preserve the sourness. The plants will probably be high in price for a long while because of the difficulty I have mentioned in propagation.

I am told it is really true that they are growing blueberries and huckleberries in the eastern part of Florida by the acre; and we have just had a sample of the berries. So far, however, they are smaller in size, and much like the swamp huckleberries on the market. We have the promise of some larger ones later.

There is a small inferior wild huckleberry growing on my own ground at Bradentown, Fla, and I am told they are growing almost all over Florida. We visited one plantation at Dunedin, Fla., where there are about 400 plants growing and in bloom. The plantation was so full of weeds, however, at the time of our visit that it did not show to very good advantage.

Below is a clipping just at hand:

> Picking is in full swing on the Sapp Blueberry Farm in Okaloosa County, a large force of women and children being given employment at remunerative wages, and the berries are meeting with a ready sale at 15 cents per quart. From one bush so far this year Mr. Sapp has picked over thirty quarts and there are fully two-thirds as many more yet to ripen.—DeFuniak (Fla.) Breeze.

And here is something from Miss White herself:

> Dear Mr. Root:
>
> I am so sorry I was unable to personally show you the blueberries the other day, tho surely Mr. Hutton was a good guide.
>
> He tells me you desire illustrations for an article in your magazine, and I take pleasure in supplying them.
>
> The cluster illustrates Katherine, a hybrid produced by Dr. Frederick V. Coville of the U. S. Department of Agriculture, by crossing two wild bushes. The other picture illustrates a choice bush on which the berries are being measured with a blueberry gauge, and otherwise studied. For some time previously it has been protected from birds, etc., by a screen of netting, which has been set back to facilitate the examination.
>
> With kindest regards, I am,
>
> Sincerely yours,
> Elizabeth C. White.
>
> New Lisbon, N. J., July 11, 1921.

Our good friend Miss Elizabeth White, who started the work of improved huckleberries. Her broad-brimmed hat does not give us much of a glimpse of her face; and, altho I was considerably disappointed at not meeting her face to face, it rejoiced my heart to know that she was interested in the feeble-minded of her region as well as in giving the world this wonderful new and luscious fruit. "Ye are of more value than many sparrows."

Classified Advertisements

Notices will be inserted in these classified columns for 30c per line. Advertisements intended for this department cannot be less than two lines, and you must say you want your advertisement in the classified column or we will not be responsible for errors. Copy should be received by 15th of preceding month to insure insertion.

REGULAR ADVERTISEMENTS DISCONTINUED IN GOOD STANDING.

(Temporary advertisers and advertisers of small lots, when discontinued, are not here listed. It is only regular advertisers of regular lines who are here listed when their advertisements are discontinued when they are in good standing.)

Bert Smith, J. J. Lewis, Heard & Woodhull, W. A. Hunter, E. A. Harris, R. F. Holtermann, J. B. Marshall & Son, P. W. Stowell, H. S. Ostrander, C. M. Elfer, Wm. C. Smith, Otto J. Spahn, Curd Walker, Van Wyngarden Bros., E. F. Quigley & Son, F. M. Russell, H. N. Major, Jensen's Apiaries, Herman McConnell, Paton & Cowell, Oscar Mayeux.

HONEY AND WAX FOR SALE.

FOR SALE—Fancy clover honey in 60-lb. cans. Jos. Hanke, Port Washington, Wis.

FOR SALE—Choice white clover honey in 60-lb. cans—none finer. J. F. Moore, Tiffin, Ohio.

FOR SALE—Fine quality raspberry milkweed honey in 5-lb. and 10-lb. pails and 60-lb. cans. P. W. Sowinski, Bellaire, Mich.

FOR SALE—A ton of extracted honey suitable for baking purposes. E. D. Townsend & Sons, Northstar, Michigan.

FOR SALE—Several thousand pounds of the finest quality clover extracted honey. New cans and cases. None better produced. Howard Townsend, Northstar, Michigan.

FOR SALE—8000 lbs. choice white clover extracted honey. State quantity wanted. Sample 20c, applied on first order. C. H. Hodgkin, Rochester, Ohio.

FOR SALE—Extra choice extracted white clover honey, put up in new 60-lb. cans and 5-lb. pails. Sample 20c, same to apply on first order. David Running, Filion, Mich.

FOR SALE—Clover, basswood or buckwheat honey, comb and extracted, by the case, ton, or carload. Let me supply your wants with this fine N. Y. State Honey. C. B. Howard, Geneva, N. Y.

FOR SALE—White clover honey, almost water white. Put up in new 60-lb. tin cans, two to the case. Write for prices. D. R. Townsend, Northstar, Mich.

FOR SALE—White honey in 60-lb. cans, sample and price on request. Also white clover comb, 24 sections to case. The A. I. Root Co., Inc., 23 Leonard St., New York City.

FOR SALE—White honey, 15c a lb.; L. A. alfalfa, 14c, in two 60-lb. cans; Chilian in 165-lb. kegs, 10c; light amber honey in 50-gal. bbls., 80c a gal. Beeswax, 30c a lb. Walter C. Morris, 105 Hudson St., New York City.

FOR SALE—New crop fancy white comb honey, No. 1 grade, $7.00 per case of 24 sections; No. 2 grade, $6.00. Extracted clover honey, 15c per pound; amber and buckwheat, 12½c per pound; two 60-lb. cans to case. Amber in 50-gal. barrels, 10c per pound. H. G. Quirin, Bellevue, Ohio.

FOR SALE—Choice clover extracted honey. State quantity wanted. New crop will be ready about August 10. J. D. Beals, Oto, Iowa.

FOR SALE—Our crop of 60,000 lbs. finest quality comb and extracted honey. Also 4000 lbs. of last year's extracted honey at reduced prices. Gelser Bros., Dalton, N. Y.

FOR SALE—Finest basswood and white clover honey in 60-lb. cans. In single cases, $9.25; in double, $18.00, f. o. b. Weston. Sample 20c. A. S. Tedman, Weston, Mich.

FOR SALE—Finest white clover extracted honey. One 60-lb. can, $9.60; two 60-lb. cans, $18.00, f. o. b. Holgate, Ohio. 5-lb. pail, $1.25; 10-lb. pail, $2.25; delivered to 4th postal zone. Noah Bordner, Holgate, Ohio.

HONEY FOR SALE—In 60-lb. tins, water-white orange, 14c; water-white sweet clover, 12c; extra L. A. sage, 11c; N. Y. State buckwheat, 10c, for immediate shipment from New York. Hoffman & Hauck, Inc., Woodhaven, N. Y.

YOU only have to buy 600 pounds of E. D. Townsend & Sons' fine clover extracted honey to get their very lowest wholesale price this year. If your customers require the best, write them at Northstar, Michigan, for their price.

FOR SALE—Extra fine Michigan white clover and basswood honey. Almost water white. Indeed, I doubt if the color, body, and flavor can be beat. Put up in 60-lb. cans, two to the case, at 15c per pound, or in 5-lb. pails, 50 to the barrel, at 17c per pound. Sample 15c. O. H. Schmidt, R. D. No. 5, Bay City, Mich.

FOR SALE—A carload of the very finest quality extracted honey. This crop of honey was produced above excluders, in white combs that have never been used for brood; then the entire crop was left upon the hives until some time after the close of the honey flow, so is very thoroly cured by the bees. It is being put into new 60-lb. net tin cans, in fact, not a single thing has been neglected to make this crop of honey the finest possible to produce. It was gathered from white clover principally, with a very little basswood mixed in it, perhaps 5%. Of course, this fine honey is worth more than ordinary honey and we have to ask just a little above market price for it, so those not having a market that will pay a little more for an extra quality honey, had better not write about this year's crop of honey. The crop will be ready for the market some time this month, August. E. D. Townsend & Sons, Northstar, Michigan.

HONEY AND WAX WANTED.

HONEY WANTED—Give particulars in first letter. Elton Warner, "Beaverdam," Asheville, N. C.

BEESWAX WANTED—For manufacture into SUPERIOR FOUNDATION. (Weed Process.)
Superior Honey Co., Ogden, Utah.

BEESWAX wanted. Old combs (dry)and cappings for rendering. Also wax accepted in trade. Top market prices offered. A. I. Root Co. of Iowa, Council Bluffs, Iowa.

WANTED—All kinds comb and extracted honey and beeswax. Car lots or less—and full colonies of bees. W. C. Morris, 170 Rossiter Ave., Yonkers, N. Y.

WANTED—To get in touch with a beekeeper who has got well-ripened white clover extracted honey for sale. State lowest price per ton. Gust Hubert, Loleta, Calif.

WANTED—Shipments of old combs and cappings for rendering. We pay the highest cash and trade prices, charging but 5c a pound for wax rendered. The Fred W. Muth Co., Pearl and Walnut Sts., Cincinnati, O.

OLD COMBS WANTED—Our steam wax-presses will get every ounce of beeswax out of old combs, cappings, or slumgum. Send for our terms and our new 1921 catalog. We will buy your share of the wax for cash or will work it into foundation for you. Dadant & Sons, Hamilton, Illinois.

WANTED—Beeswax. We are paying 1 and 2c extra for choice yellow beeswax, and in exchange for supplies we can offer a still better price. Be sure your shipment bears your name and address, so we can identify it immediately upon arrival, and make prompt remittance. The A. I. Root Co., Medina, Ohio.

FOR SALE.

HONEY LABELS—New designs. Catalog free. Eastern Label Co., Clintonville, Conn.

FOR SALE—A full line of Root's goods at Root's prices. A. L. Healey, Mayaguez, Porto Rico.

ROOT'S goods at Root prices. A. W. Yates, 3 Chapman St., Hartford, Conn.

FOR SALE—A Cowan rapid reversible extractor, used only once. Price, $20.00. J. Doe, Harvard, Mass.

ROOT'S BEE SUPPLIES—For the Central Southwest Beekeepers. Beeswax wanted. Free catalog. Stiles Bee Supply Co., Stillwater, Okla.

PORTER BEE-ESCAPES save honey, time, and money. Great labor-savers. For sale by all dealers in bee supplies. R. & E. C. Porter, Lewiston, Ill.

FOR SALE — "SUPERIOR" FOUNDATION, "quality unexcelled." Let us prove it. Order now. Superior Honey Co., Ogden, Utah.

POWER rip and cross-cut saw, $30; Sun typewriter, $10; lathe, $3.00; 3x5 printing press, type, etc., $8.00. Clarence Foote, Delanson, N. Y.

SHIPPING CASES, 25c per case, 4¼x4¼x1½-inch. Sliding cover, 3-inch glass K. D. Sold only in original packages of 50 at $12.50 per package. Only 1000 cases. The A. I. Root Co., Medina, Ohio.

FOR SALE—One 4-frame automatic hand-power extractor, price, $45.00; one 2-frame with 12-inch pockets. Cowan rapid reversible, $25.00, as good as new. Jos. H. Hoehn, Ottoville, Ohio.

FOR SALE—Combined clover huller and scarifier, two screens and one extra set of linings, $3.50. Postage extra. S. Rouse, Ludlow, R. D. No. 2, Ky.

FOR SALE—Single-tier comb shipping cases and carriers, K. D. all sizes, at bargain prices. Also covers, bottoms, supers, etc. Write for my new bargain list and be convinced. C. C. Brinton, Bloomsburg, Pa.

FOR SALE—50 Standard, two-story, ten-frame, metal-covered hives, nailed, painted, with Hoffman frames, wired, with full sheets of foundation. In lots of five or more, $5.00 each, f. o. b. Mobile, Alabama. H. A. Goering, Crichton, Ala.

FOR SALE—One 4-horse power gasoline engine. Just the thing to run an extractor. Have used same for this purpose for two seasons. Price, $60, f. o. b. Syracuse, N. Y. Chas. G. Schamu, University Block, Syracuse, N. Y.

HONEY CONTAINERS—100 cases round jars, 16 oz., put up 2 doz. in case; per 10 cases, $16.50; per 25 cases, $40.00. 400 cases containing two 5-gallon cans, second-hand; per 10 cases, $7.00; per 25 cases, $15.00; per 100 cases, $50.00. The A. I. Root Co., 230 W. Huron St., Chicago, Ills.

WANTS AND EXCHANGES.

WANTED—Extractor, state size, condition, and price. Walter P. Brown, Carthage, R. D. No. 4, Mo.

WANTED—Second-hand Cowan honey extractor. Carl Erikson, Nora Springs, Iowa.

WANTED—At once, a two-pocket reversible extractor with brake. State price. Van Collins, Port Chester, R. D. No. 1, N. Y.

WANTED—Old combs and cappings for rendering on shares. Our steam equipment secures all the wax. Superior Honey Co., Ogden, Utah.

WANTED—Root capping melter, separating can, one-burner oil stove. Leon D. Thayer, Cummington, Mass.

FOR SALE OR TRADE—For power extracting equipment or anything you have, old and new eight and ten-frame hives, two foundation mills, Hatch wax press, Root two-frame extractor, 60 lbs. foundation, and other supplies. Hickory Shade Apiary, Otterville, Mo.

REAL ESTATE

FOR SALE—40-acre farm ¼ mile from town, 10-room house, frame barn, windmill, telephone, orchard, 20 swarms of bees in eight and nine frame Hilton hives, extractor and hives and other supplies to operate 100 swarms, honey-house. Mrs. Fred Snyder, Bentley, Mich.

NOTICE—We have a productive territory for beekeeping and the property advertised by me in July issue of Gleanings will pay—the farm 25 to 50%, the bees 50 to 100% annually, plus cost of operating. This is a conservative estimate. B. F. Averill, Howardsville, Va.

FOR SALE—Big bargain! Selling out, leaving the State. I will sell my fine apiary of 100 colonies of Italian bees in 8 and 10 frame new hives, and all up-to-date equipment for running same, on a buckwheat location, 30 miles west of Alexander's apiary in New York State, in village three miles from car line, includes all my honey customers, good for 4 tons of honey each season. Good will, etc., also includes house, one acre of good land, fruit, bee-cellar, honey house, etc. All for $1700 cash. Get busy and write me. Walter J. D'Alliard, Amsterdam, R. D. No. 5, N. Y.

MISCELLANEOUS

HUBAM, or White Annual Sweet Clover. Grow it for your bees, and get a seed crop, while the seed is scarce. Booking orders for fall delivery. E. G. Lewis Co., Media, Ills.

MEDICINAL roots and herbs are very profitable to grow. We especially recommend growing Golden Seal, which with good care will yield as high as $10,000 per acre for each crop. It takes several years to mature but will average $1000 a year. Special Crops, a monthly paper, tells how. Sample copy, 10c; $1.00 per year. Address Special Crops Pub. Co., Box "G," Skaneateles, N. Y.

BEES AND QUEENS.

FOR SALE—Italian queens, nuclei, and packages. B. F. Kindig, E. Lansing, Mich.

HARDY Italian queens, $1.00 each.
W. G. Lauver, Middletown, Pa.

THAGARD ITALIAN QUEENS—See display advertisement elsewhere.

SIMMONS' ITALIAN QUEENS bees and nuclei. Fairmount Apiary, Livingston, N. Y.

SEE our large advertisement on page 522 for prices. Buckeye Bee Co., Justus, Ohio.

WHEN it's GOLDEN, it's PHELPS. C. W. Phelps & Son, Binghamton, N. Y.

FOR SALE—100 colonies bees in lots to suit buyer. R. S. Becktell, Rifle, Colo.

GOLDEN Italian queens, untested, 1, $1.25; 6, $7.00. E. A. Simmons, Greenville, Ala.

MY famous Italian queens, June 1 and later, $1.50 each, six for $8.00. J. W. Romberger, Apiarian, 3113 Locust St., St. Joseph, Mo.

IF you want queens that will produce results, give THAGARD'S ITALIAN QUEENS a trial. V. R. Thagard, Greenville, Ala.

QUEENS—Three-banded Italians, untested $1.25 each; $12.00 for 12. Satisfaction guaranteed. J. D. Kroha, 87 North St., Danbury, Conn.

FOR SALE—Golden Italian queens, untested, $1.00; 6, $5.00. Tested, $2.00. J. F. Michael, Winchester, Ind.

PHELPS GOLDEN QUEENS will please you. Mated, $2.00; 6, $10.00; or $18.00 a doz. C. W. Phelps & Son, Binghamton, N. Y.

FOR SALE—15 colonies pure-bred Italian bees. queens 1920, full equipment, mostly new. Emil Uyldert, New Brunswick, N. J.

FOR SALE—20 colonies bees in standard L. hives, $10.00 per hive. T. A. Kragness, 6031 Wentworth Ave., Chicago, Ills.

FOR SALE—Untested Italian queens, three-banded only, $1.50 each; 8.00 per half doz., $15.00 per doz. J. F. Garretson, Bound Brook, N. J.

BEES AND QUEENS from my Carolina apiaries —progeny of my famous Porto Rican pedigreed breeding stock. Elton Warner, Asheville, N. C.

THAGARD'S ITALIAN QUEENS produce workers that fill the supers quick. V. R. Thagard, Greenville, Ala.

FOR SALE—A few choice queens shipped in frame brood, $4.00 each. Jes Dalton, Bordelonville, La.

THE A. I. ROOT CO. pure leather-colored queens, untested, 1, $1.25; 6, $7.00. Greenville Bee Co., Greenville, Ala.

FOR SALE—Bright Italian queens, $1.50 each; $14.00 per doz. Ready after April 15. T. J. Talley, Greenville, R. D. No. 3, Ala.

FOR SALE—Golden queens ready May 1; 1, $1.50; 6, $7.50; 12, $14.00; 100, $100. Virgins, 75c each. W. W. Talley, Greenville, R. D. 4, Ala.

FOR SALE—50 colonies Italian bees. Price reasonable. Write for particulars. Geo. H. Rea, 206 Chestnut St., Ithaca, N. Y.

PROMPT shipment of Golden or three-banded queens. Untested only. One, $1.25; 6, $7.00; 12, $13.00. Safe arrival and satisfaction. Ross B. Scott, LaGrange, Ind.

FOR SALE—Pure Italian queens reared from the best honey-producing mothers, mated to pure drones. Untested, each, $1.25; 6, $7.00; 12, $13.00; tested, each, $2.50. H. N. Boley, Hillsboro, Iowa.

PURE ITALIAN BEES—Not the cheapest, but the best we can grow, both golden and three-banded, with clean bill of health. Sure to please. Such as we use in our own yards. Untested, $1.25; tested, $2.00. J. B. Notestein, Bradentown, Fla.

FOR SALE—Leather-colored Italian queens from Dr. Miller's breeder. Virgins, $1.00; mated, $1.50; tested, $2.50. F. R. Davis, Standfordville, Dutchess County, N. Y.

AM now ready to mail out young queens of Dr. Miller strain leather-colored Italians, by return mail, at $1.25 each. A few breeders for sale. S. G. Crocker, Jr., Roland Park, Baltimore, Md.

ITALIAN QUEENS OF WINDMERE are superior three-banded stock. Untested, $1.50 each; 6 for $8.00; tested, $2.50 each; select tested, $3.00. Prof. W. A. Matheny, Ohio University, Athens, O.

COLORADO QUEENS. Pure Italians. Our sunny climate and altitude produce the best there are. Write now for price list. C. I. Goodrich, breeder of fine queens, Wheatridge, Colo.

FOR SALE — Hardy Northern-bred Italian queens and bees. Each and every queen warranted satisfactory. For prices and further information, write. H. G. Quirin, Bellevue, Ohio.

SHE-SUITS-ME queens, season of 1921. Untested Italians: After June 15, $1.50 each, up to nine queens; 10 to 24 queens, $1.40 each; 25 and up, $1.25. Allen Latham, Norwichtown, Conn.

FOR SALE—Golden queens, untested, $1.15; 6 or more, $1.10 each; select untested, $1.60; 6 or more, $1.50 each; safe arrival. Hazel V. Bonkemeyer, Randleman, R. D. No. 2, N. C.

FOR SALE—Leather-colored Italian queens, tested, until June 1, $2.50; after, $2.00; untested, $1.25; 12, $13.00. Root's goods at Root's prices. A. W. Yates, 15 Chapman St., Hartford, Conn.

BEES BY THE POUND — Also QUEENS, Booking orders now. FREE circulars giving details. See larger ad elsewhere. Nueces County Apiaries, Calallen, Texas. E. B. Ault, Prop.

FOR SALE—250 colonies Italian bees in 10-frame hives, free from disease. Also supers, combs and winter cases. Locations go with bees if wanted. Fred D. Lamkin, Poplar Ridge, N. Y.

FOR SALE—Three-banded Italian queens, untested, $1.25; 6, $7.50; 12, $14.00. Tested queens, $2.50 each. The above queens are all select. Robt. B. Spicer, Wharton, N. J.

FOR SALE—Highest grade three-banded Italian queens. Untested, each, $1.25; 6, $6.50; 12, $12; 50, $47.50; 100, $90. Virgins, 45c each. No disease and satisfaction guaranteed. A. E. Crandall, Berlin, Conn.

FOR SALE—Golden Italian queens, untested, $1.15; 6 for $6.50; 12 or more, $1.00 each; tested, $2.00 each; select tested, $3.00 each; extra select tested, $4.00 each. No bees for sale. D. T. Gaster, Randleman, R. D. No. 2, N. C.

IF GOOD bright Italian queens are wanted by return mail, send your order to M. Bates, Greenville, Ala. Price, $1.00 each; $10.00 per dozen; $75 per 100. Pure mating, safe arrival, and satisfaction guaranteed.

WE believe we have the best Italian queens obtainable. Our new system is working wonders. Book your order now for 1921. Untested, $1.25; tested, $2.25; virgins, imported mothers, 50c. Am booking orders for 1922. F. M. Russell, Roxbury, Ohio.

FOR SALE—Packages, nuclei, and pure-bred queens—queens from Root home-bred breeders. Untested, $1.50; tested, $2.50; select tested, $3.00. Safe arrival and mating guaranteed. The Southland Apiaries, Hattiesburg, Miss. W. S. Tatum, Prop.

MR. BEEKEEPER—Before placing your order for queens you should read the ad at top of page 464 in the July issue of Gleanings. It will mean money saved as well as a big honey crop next season. Herman McConnell, Robinson, Ills.

PHELPS' GOLDEN ITALIAN QUEENS: Virgins, $1.00; mated, $2.00; 6 for $10.00, or $18.00 per doz. C. W. Phelps & Son, Binghamton, N. Y.

FOR SALE—Unsurpassed Italian queens, Untested, 1, $1.50; 6, $7.50; 12, $14.00; 50, $55.00; 100, $105. Tested, 1, $2.50; 6, $13.50. My queens are actually laying before they are sent out. J. D. Harrah, Freewater, Oregon.

HUMMER QUEENS—Untested, $1.00 each; $9.00 per dozen; tested, $1.50 each; $15.00 per dozen. A trial will convince you that they cannot be beaten. Safe arrival and satisfaction guaranteed. Nuclei at same old prices. Geo. A. Hummer & Sons, Prairie Point, Miss.

FOR SALE—Root's strain of Golden and leather-colored Italian queens, bees by the pound and nuclei. Untested, $1.50 each; select untested, $2.00; tested, $2.50 each; select tested, $3.00. For larger lots write. Circular free. A. J. Pinard, 440 N. 6th St., San Jose, Calif.

THREE-BANDED Italians only, that have been bred to a high standard of excellence. Never had disease in my apiaries. Safe arrival and satisfaction guaranteed. Untested queens, $1.50; 12, $15.00; tested queens, $2.25; 12, $25.00. Jul Buegeler, New Ulm, Texas.

WE are now equipped to handle your early spring orders for package bees, and Italian queens, especially bred for the production of honey. Prices will be in accord with the reduction in material and labor. Safe arrival guaranteed. Write for prices and terms. Sarasota Bee Co., Sarasota, Fla.

NORTH CAROLINA bred Italian queens of the Dr. C. C. Miller strain of three-banded Italian bees, gentle and good honey-gatherers, from July 1 until Oct. 1. Untested, $1.25 each; $12.00 per doz.; tested, $2.00 each; select tested, $3.00 each. Safe arrival and satisfaction guaranteed. L. Parker, R. F. D. No. 2, Benson, N. C.

QUEENS—A SUPERIOR STRAIN. Bred from a queen whose colony gathered 200 lbs. honey while the other colonies did very little. Queens, untested, $2.00 each; tested, $3.00. Doolittle strain; queens, untested, $1.25; tested, $2.00. 40 years' experience in queen-rearing. Chestnut Hill Apiary, Aspers, Pa.

TO MY FRIENDS, OLD AND NEW—During our buckwheat flow we rear our best queens. Hardy, prolific, disease-resistant, honey-gathering Italian stock. We have combined color and utility and each queen guaranteed to arrive safely and give satisfaction. August prices by return mail, untested, 1, $1.25; 6, $7.00; 12, $13.00; 25 for $25.00. J. B. Hollopeter, Rockton, Pa.

FOR SALE—Three-banded leather-colored bees and queens of the J. P. Moore strain, hardy, prolific, hustlers, no disease. Safe arrival and satisfaction guaranteed. Prompt attention given all orders. 1 untested, $1.00; 12, $10.00; 1 select untested, $1.25; 12, $13.50; 1 tested, $1.75; 12, $16.00; 1 select tested, 2.25; 12, $20.00. J. M. Cutts, Montgomery, R. D. No. 1, Ala.

AS I am continuing in charge of Apiary Inspection with the State Dept. of Agriculture, I find it necessary to sell about 100 colonies of bees, all in good equipment. All colonies are headed by young queens of my own rearing. Price f. o. b. Lansing. Ten-frame colony, $16.00; same, two-story, $20.00. Eight-frame colony, $14; same, two-story, $18.00. B. F. Kindig, East Lansing, Mich.

ANYTHING is good enough until something comes along that is better. Even a good imitation gains admiration until compared with the genuine. Likewise with queens. The market is flooded with many strains. Extravagant claims run riotous. However, quality is quickly detected by the expert. Compare Victor's Italian queens with other strains, and their superiority is noted immediately. Price: 1, 1.25; 6, $7.00; 12, $13.50. Julius Victor, Martinsville, N. Y.

DAY-OLD QUEENS—1, 50c; 100, $50.00; 500, $250.00. Untested queens, $1.00 each. High quality three-banded Italians. Mailed in safety introducing cages. Delivery and satisfaction guaranteed in U. S. and Canada. Information in circular. Order early. James McKee, Riverside, Calif.

"QUEENS, QUALITY FIRST QUEENS." High-grade, pure, three-banded and golden Italians. These queens are as good as can be bought; are gentle, prolific, and good honey-gatherers. I guarantee safe arrival and satisfaction. Why not try these and be convinced? Untested, $1.00 each; 6, $6.00; 12, $12.00; 50, $45.00. G. H. Merrill, Pickens, S. C.

FOR SALE—Italian queens: From July 1 to October 1, untested: 1, $1.25; 6, $7.00; 12, $13.50; tested, $2.00. I have a tested breeding queen from the A. I. Root Co., and will breed queens from her for those that prefer them to my old strain of hustlers. Safe delivery and satisfaction guaranteed. R. B. Grout, Jamaica, Vt.

ITALIAN QUEENS—Three-banded, select untested, guaranteed. Queen and drone mothers are chosen from colonies noted for honey production, hardiness, prolificness, gentleness, and perfect markings. Price after July 1, $1.25 each; one dozen or more, $1.00 each. Package bees a specialty. Send for circular. J. H. Haughey Co., Berrien Springs, Mich.

FOR requeening, use Williams heavy laying Italian queens. They produce hardy, hustling, three-banded workers. Bred from the best disease-resisting strain, and priced in accordance with the present price of honey. Untested, $1.25; 6 for $6.50; 12 or more, $1.00 each; tested, $2.00. Satisfaction guaranteed. P. M. Williams, Ft. Deposit, Ala.

FOR SALE—Until further notice we are offering our bright Italian queens, untested, at $1.00 each; $10.00 per dozen; $75 per 100. We guarantee safe arrival, pure mating and reasonable satisfaction in U. S. and Canada. Cash must accompany all orders unless parties are known or satisfactorily rated. Graydon Bros., Greenville, R. D. No. 4, Ala.

"WELL, the queen you sent me was extra high grade. I am truly pleased. She does not stop laying when the frame she is on is taken out. This is due to her being of very quiet disposition and extra prolific. I have seen the time back North when I would have paid $25.00 cash for such a queen. Very truly, Geo. W. Fuller, Auburndale, Fla." If you are keeping bees why not keep the best? Untested, $1.00; select untested, $1.50; tested, $2.00; select tested, $2.50. Safe arrival and satisfaction guaranteed. No disease. M. F. Perry, Bradentown, Fla.

PRITCHARD QUEENS (Three-banded Italians.)—Price, untested, $1.50 each, 6 for $8.00; select untested, $1.75 each, 6 for $9.50. A liberal discount will be given on larger quantities. I will have a few choice virgins, tested, and breeders to spare; write for prices. Queens clipped free of charge on request. Acknowledgment and directions for introducing sent on receipt of order. Safe delivery and satisfaction guaranteed. Specify date of shipment desired, otherwise orders will be filled in rotation. Arlie Pritchard, Medina, Ohio.

ONE HUNDRED—When my brother, W. Z. Hutchinson, was living, we used to buy queens of J. P. Moore by the hundred each year to requeen our colonies. The last few years I have raised the queens we needed, breeding from the best in over 300 colonies of this strain. I know that I have improved the strain I started with. They are gentle, hardy, and good workers. We have 100 tested queens of this strain, one year or less old, for sale. In order to close them all out this month I will sell them for $1.50 each, or $16.80 per doz. They are right in their prime, first class in every respect. They should do good work another year yet. Safe arrival and satisfaction guaranteed. Elmer Hutchinson & Son, Lake City, Mich.

CALIFORNIA ITALIAN QUEENS, the old reliable three-banded stock that delivers the goods. Every queen actually LAYING before being caged, and fully guaranteed. I also guarantee safe arrival. SPECIAL FALL PRICES, select untested, 1, $1.25; 6, $7.00; 12, $13.00; 25 to 99, $1.00 each; 100 and over, 90c each. Package bees for next spring delivery. Circular free. California Apiaries, J. E. Wing, Prop., 155 Schiele Ave., San Jose, Calif.

JENSEN'S QUEENS BY SELECTION—Bees in nuclei, and full colonies. Untested, $1.00 each; $9.00 per doz. Select untested, $1.25; dozen or more, $1.00 each. Tested, $1.75 each. Select tested, $3.00. Breeders, $5.00. Nuclei, two-frame with untested queen, $4.50; three-frame with untested queen, $6.00; 8-frame colony, $15.00; 10-frame, $17.50 with tested queens, in dovetailed hives, combs drawn from full sheets. Pure mating, no disease, prompt service and satisfaction guaranteed. Jensen's Apiaries, Crawford, R. D. No. 3, Miss.

HELP WANTED.

WANTED—A manager for the Michigan Honey Producers' Exchange, Inc. Must be a practical supply man and thoroly understand bottling and sale of honey. A good position for the right man. Applicant kindly give age, experience, and reference in first letter, and oblige. E. D. Townsend, Chairman, Northstar, Mich.

INDIANOLA APIARY

will furnish 3-banded Italian bees and queens: Untested queens, $1.00 each; tested, $1.50 each. One pound bees, no queen, $2.00. No disease.

J.W.SHERMAN,VALDOSTA,GA.

QUEENS

Quirin's Northern-bred hardy Italians now ready. Safe delivery and satisfaction guaranteed.

PRICES OF BEES AND QUEENS.
(After July 1st)

	1	6	12
Untested	$1.50	$ 8.00	$15.00
Tested	2.00	10.00	18.00
2-comb Nuclei	6.00	32.00	60.00
3-comb Nuclei	8.00	45.00	85.00
8-fr. Colony..	12.00	70.00	
10-fr. Colony.	15.00	85.00	
Breeders, fair			5.00
The very best, each......			10.00

Add the price of the queen wanted with nuclei or colony. This is our 30th consecutive season at queen-rearing.

Address all orders to

H. G. QUIRIN
BELLEVUE, OHIO

HONEY! HONEY! HONEY!

Beekeepers who are supplying Honey to a regular family trade, or who are located along the highways, and are supplying motorists, know that their customers want a honey of a uniform color and flavor. And unless the honey is at all times uniform in color and flavor, customers sometimes become dissatisfied. Our special blend of Fancy Honeys (liquid) is always uniform and is of a fine mild flavor, and will satisfy the most exacting trade.

SPECIAL BLEND OF FANCY HONEY (Liquid)

60-lb. Tins,	2 per case....	14c lb.
10-lb. Tins,	6 per case....	16c lb.
5-lb. Tins,	12 per case....	17c lb.
2½-lb. Tins,	24 per case....	18c lb.

VARIOUS GRADES (Crystallized) 60-POUND TINS.

Water White Orange......	14c lb.
Water White Sweet Clover.	12c lb.
Extra Light Amber Sage..	11c lb.
N. Y. State Buckwheat....	10c lb.

GLASS AND TIN HONEY CONTAINERS

2½-lb. Cans, 2 dozen reshipping cases..............	$1.45 case; crates of 100,	$ 6.50
5-lb. Pails (with handles), 1 dozen reshipping cases	1.35 case; crates of 100,	8.30
10-lb. Pails (with handles), ½ dozen reshipping cases	1.10 case; crates of 100,	12.75

60-lb. Tins, 2 per case—NEW, $1.30 case; USED, 50c.

WHITE FLINT GLASS, WITH GOLD LACQD. WAX LINED CAPS.

8-oz. Honey Capacity, Cylinder Style	$1.50 per carton of 3 dozen
16-oz. Honey Capacity, Table Jar Service..............	1.40 per carton of 2 dozen
Quart or 3-lb. Honey Capacity, Mason Style	1.00 per carton of 1 dozen

Hoffman & Hauck, Inc., Woodhaven. New York

THE OLD RELIABLE THREE-BANDED ITALIANS

Our Italians are of an exceptionally vigorous and long-lived strain of bees. They are gentle, prolific. very resistant to foul brood, and the best of honey-gatherers. We have sold a good many queens to parties who are using them in stamping out foul brood. If you want the very best quality for the lowest price, send us your orders at once. Will guarantee safe arrival in the United States and Canada.

July to November:	1	6	12
Untested	$1.25	$6.50	$12.00
Select Untested	1.50	8.00	15.00

No nuclei or pound packages of bees for sale.

W. T. PERDUE & SONS
Route 1, Fort Deposit, Ala.

QUEENS

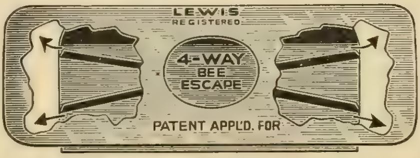
Select Three-Banded Italians. I have one of the most modern queen-rearing apiaries in the South, and am breeding from the best Italian stock to be found. Pure mating, prompt and safe arrival guaranteed.

	1	6	12	50
Untested	$1.25	$7.00	$13.00	$50.00
Tested	3.00	16.00	30.00	

Write for descriptive circular and prices on queens in lots of 100 or more.

HARDIN S. FOSTER,
Dept. G, Columbia, Tenn.

LEWIS 4-WAY BEE ESCAPES



Four exits from supers. Fits al' [illegible] boards. Springs of coppered steel. Made of substantial metal. Made by

G. B. Lewis Company, Watertown, Wis., U.S.A.

Sold only by Lewis "Beeware" Distributors.

Raise Guinea PIGS- FOR US!

We need men and women, boys and girls everywhere to raise Guinea Pigs for us. We tell you where to get them, show you how and buy all you raise. Big opportunity for money making. Thousands needed weekly.

Easy to Raise—Big Demand Large Profits No special knowledge, experience or equipment needed. They breed the year round—are very prolific—require but little space or attention. Pay better than poultry or squabs—cost less to house, feed, keep, easier raised—less trouble, market guaranteed. **FREE** Particulars, contract, and booklet how to raise

CAVIES DISTRIBUTING COMPANY
3145 Grand Avenue, Kansas City, Mo.
Largest Guinea Pig breeders and distributors in America.

Buy Your Bee Supplies Now

Take advantage of early-order discounts by ordering NOW. We guarantee to please you. "Prompt service and the very best" is our motto. *We want your beeswax and old comb.* Highest cash and trade prices offered. Texas beekeepers should write A. M. HUNT, Goldthwaite, Texas.

Manufactured by

Leahy Manufacturing Company
95 Sixth St., Higginsville, Missouri.

Write for FREE catalog. It is to your interest.

LARGE, HARDY, PROLIFIC QUEENS

Three-band Italians and Goldens. Pure mating and safe arrival guaranteed. We ship only queens that are top notchers in size, prolificness, and color. After June 1st: Untested queens, $1.50 each; 6 for $8.00; 12 or more, $1.40 each; 25 or more, $1.25 each. Tested queens, $3.00 each; six for $16.00.

Buckeye Bee Co., Justus, Ohio.

QUEENS

Good Queens priced right. Gentle Three-Band Italians. Untested, $1.25; 12 or more, $1 each. Prompt service.

D. W. HOWELL, SHELLMAN, GA.

MASON BEE SUPPLY COMPANY

MECHANIC FALLS, MAINE
From 1897 to 1921 the Northeastern
Branch of The A. I. Root Company

Prompt and Efficient Service BECAUSE—Only Root's Goods are sold.
It is a business with us—not a side line.
Eight mails daily.
Two lines of railway,

If you have not received 1921 catalog send name at once.

Queens—Rhode Island—Queens

Italian Northern-bred queens. Very gentle and hardy. Great workers. Untested, $1.25 each; 6 for $6.

Queens delivered after June 1.

O. E. TULIP, Arlington, Rhode Island
56 Lawrence Street.

Three-Band and Golden

QUEENS

That produce hustling bees. Bred to fill the supers. From the finest breeding strains obtainable. Hustlers, long-lived, and as beautiful in size and color as can be. Special price for summer and fall. Untested, $1.25 each; 12 at $1.00 each. Tested, $2.00 each. Breeders, $10.00. This is your time to requeen.

DR. WHITE BEE CO.
SANDIA, TEXAS.

NOTICE!

Pritchard Queens

are not just common queens named, but

A NOTED STRAIN

The result of years of careful breeding and selection. Reared and offered for sale by

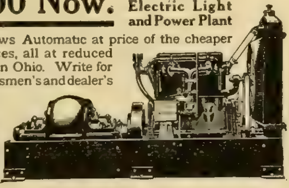
ARLIE PRITCHARD
Medina, Ohio.

See my classified ad, page 520 for prices and guarantee.

$295.00 Now. A Real 32-VOLT Electric Light and Power Plant

See the Matthews Automatic at price of the cheaper plants. Six sizes, all at reduced prices. Made in Ohio. Write for particulars. Salesmen's and dealer's best opportunity

The Matthews Engineering Co.
Farry Street
Sandusky, O.



"Best" Hand Lantern

A powerful portable lamp, giving a 300 candle power pure white light. Just what the farmer, dairyman, stockman, etc. needs. Safe—Reliable —Economical—Absolutely Rain, Storm and Bug proof. Burns either gasoline or kerosene. Light in weight. **Agents wanted. Big Profits. Write for Catalog.** THE BEST LIGHT CO.
306 E. 5th St., Canton, O.

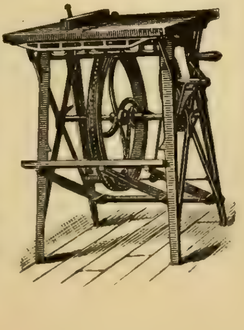
BARNES'
Hand and Foot Power Machinery

This cut represents our combined circular saw, which is made for beekeepers' use in the construction of their hives, sections, etc.

Machines on Trial

Send for illustrated catalog and prices.

W. F. & JOHN BARNES CO
545 Ruby Street
ROCKFORD, ILLINOIS



NEWMAN'S ITALIAN QUEENS Bred From the Best. Absolutely First Quality and fully guaranteed. No disease. Satisfaction and safe arrival. Untested, $1.25; 6, $7.00; 12, $13.50. Select Untested, $1.75; 6, $9.00 12, $17.00. Circular free.

A. H. NEWMAN, Queen Breeder
MORGAN, KY.

Established 1885.
Write us for catalog.

BEEKEEPERS' SUPPLIES

ALWAYS ON TOP

The Kind You Want and the Kind That Bees Need.

We have a good assortment in stock of bee supplies that are mostly needed in every apiary. The A. I. Root Co.'s brand. Let us hear from you; information given to all inquiries. Beeswax wanted for supplies or cash.

John Nebel & Son Supply Co.
High Hill, Montgomery Co., Mo.

STUTT'S ITALIAN QUEENS

are supreme queens; ready June 1. Untested, $1.25; 6, $6.50; 12, $12.50. Select untested, $1.50; 6, $8.00; 12, $15.00. Pure mating and safe arrival guaranteed.

ALFRED A. STUTT, Lincoln, Ills.

World's Best Roofing at Factory Prices

"Reo" Cluster Metal Shingles, V-Crimp, Corrugated, Standing Seam, Painted or Galvanized Roofings, Sidings, Wallboard, Paints, etc., direct to you at Rock-Bottom Factory Prices. Positively greatest offer ever made.

Edwards "Reo" Metal Shingles

cost less; outlast three ordinary roofs. No painting or repairs. Guaranteed rot, fire, rust, lightning proof.

Free Roofing Book

Get our wonderfully low prices and free samples. We sell direct to you and save you all in-between dealer's profits. Ask for Book No. 183

LOW PRICED GARAGES

Lowest prices on Ready-Made Fire-Proof Steel Garages. Set up any place. Send postal for Garage Book, showing styles.
THE EDWARDS MFG. CO.,
833-883 Pike St., Cincinnati, O.

FREE Samples & Roofing Book

Select Three-Banded Italians of the Highest Quality
One Grade

800 honey-gathering colonies from which to select the very best breeders. No one has better bees than I. Can make prompt delivery by return mail. I have not yet disappointed a customer.

A new customer from Missouri where you have to show them, writes: "The dozen queens arrived promptly. They are the most beautiful I ever saw."—(Name on request.)

Another one from the same state writes: "Your 100 2-lb. packages averaged 90 lbs. surplus honey per colony, 10 lbs. more per colony than the other 2-lb. packages purchased elsewhere."—H. H. Thale, Durham, Mo.

Now listen to this, from Ontario, Canada: "Bees and queens purchased of you last season all wintered without a single loss. Save me 50 untested queens for May delivery."—(Name on request.)

My customers say my queens stand the northern winters. They are bred up for this, combined with the highest honey-gathering qualities and prolificness.

Pure mating, safe arrival and satisfaction guaranteed. It is left with customer to say what is satisfaction.

Prices for balance of season: 1 Untested Queen, $1.00; for 6, $5.50; for 12 or more, $10.00 per dozen. Tested Queens, $2.00 each.

JASPER KNIGHT, HAYNEVILLE, ALA.

(Continued from page 501.)

faculties remained strong and alert to the end of his long active life. One day in his eighty-second year, he wrote a letter to a friend and two days later, in the arms of his daughter, dropped quietly off in the last sleep — "the immortal incommunicable dream."

Spicer's Three-Banded Italian Queens

now ready to mail. These queens are bred so as to have all the desired qualities, hustlers, hardy, and gentle.

	1	6	12
Untested queens	$1.25	$7.50	$14.00
Tested queens	2.50	15.00	28.00

I do not list select queens, as the above are all select. Safe arrival and satisfaction guaranteed.

ROBERT B. SPICER
Wharton, N. J.

NEW ENGLAND

BEEKEEPERS will find a complete stock of up-to-date supplies here. Remember we are in the shipping center of New England. If you do not have a 1921 catalog send for one at once.

H. H. Jepson, 182 Friend St., Boston 14, Mass.

GOLDEN OR THREE-BAND QUEENS.

Untested, balance of season, $1.00 each; doz. $10.00, or $80.00 per hundred. Virgins, 50c each, or $40.00 per hundred. All orders filled promptly or parties notified when to expect shipment; satisfaction.

R. O. COX, Rt. 4, Luverne, Ala.

PATENTS Practice in Patent Office and Court. Patent Counsel of The A. I. Root Co.

Chas. J. Williamson, McLachlan Building,
WASHINGTON, D. C.

"QUEENS OF QUALITY"

3-band Italians only.

Untested, $1.25 each; six for $7.00; $12.00 per dozen.

We are now shipping by return mail.

J. I. BANKS
Dowelltown, Tenn.

QUEENS OF MOORE'S STRAIN OF ITALIANS PRODUCE WORKERS

That fill the super quick
With honey nice and thick.

They have won a world-wide reputation for honey-gathering, hardiness, gentleness, etc. Untested queens $1.50; 6, $8.00; 12, $15.00 Select untested $2.00; 6, $10.00; 12, $19.00 Safe arrival and satisfaction guaranteed. Circular free. I am now filling orders by return mail.

J. P. MOORE, Queen Breeder
Route 1, Morgan, Kentucky

I. F. MILLER'S STRAIN ITALIAN QUEEN BEES.

Northern bred for business; from my best SUPERIOR BREEDER (11 frames brood on April 7), gentle, roll honey in, hardy, winter well, not inclined to swarm, three-banded, 27 years' breeding experience. Satisfaction guaranteed. Safe arrival in U. S. and Canada. Untested, $1.50; 6, $8.00; 12, $14.00. Select, $1.75; 6, $9.00; 12, $17.00.

I. F. MILLER
Brookville, R. D. No. 2, Pa.

Good Queens

3-Banded or Golden

Northern Queens for Northern Beekeepers

THEY WILL PLEASE YOU.

Prompt shipment of queens reared in strong colonies and mated in strong nuclei.

Untested: 1, $1.25; 6, $7.00; 12, $13.00; 100, $100.00.

Safe arrival and satisfaction.

ROSS B. SCOTT
LAGRANGE INDIANA

QUALITY TIN CANS FIRST

For PACKERS and MANUFACTURERS of FOOD PRODUCTS

LARGE CAPACITY
LONG EXPERIENCE

YOUR INQUIRIES SOLICITED

W. W. BOYER & CO. INC.
BALTIMORE, MD.

Indianapolis Can Give You Some Real Beekeeping Service

We ship your order the same day it is received. Let us give you some of this service. Catalog for the asking. Write for prices on beeswax.

THE A. I. ROOT COMPANY
873 Massachusetts Avenue, Indianapolis, Ind.

BANKING BY MAIL AT 4%

We have many out of town depositors. They send their deposits by mail. You can also carry an account with this institution. Savings draw 4% interest.

THE SAVINGS DEPOSIT BANK CO.
A. T. SPITZER, Pres.
E. R. ROOT, Vice Pres. E. B. SPITZER, Cash.
MEDINA, OHIO

QUEENS FULL COLONIES AND NUCLEI QUEENS

Our bees are hustlers for honey, prolific, gentle, very resistant to European Foul Brood, our customers tell us. For years we have been shipping thousands of queens and pounds of bees all over the U. S. A. and Canada. We are continually getting letters with statements such as the following: "Well pleased with your stock," "Best we ever had," "The bees we got from you are the tops (best) we have in our 225 colonies," "Bees arrived in fine shape, well pleased," etc., etc. Write for circulars giving details, etc. We are quoting a lower price for balance of the year, but will still hold up the high standard of quality.

I have a good proposition for 2 or 3 Northern beekeepers that would like to come South this fall. Write for particulars.

QUEENS AFTER JULY 1st, BALANCE OF THE YEAR:

Untested	$1.35 each	25 or more, $1.00 each
Select Unt.	1.50 each	25 or more, 1.25 each
Tested	2.25 each	25 or more, 1.75 each
Select Tested	2.75 each	25 or more, 2.00 each

1 lb. of bees	$2.25 each	25 or more, $2.13 each
2 lbs. of bees	3.75 each	25 or more, 3.56 each
3 lbs. of bees	5.25 each	25 or more, 4.98 each

Add price of queen wanted when ordering bees.

Safe arrival guaranteed within six days of here.

NUECES COUNTY APIARIES

E. B. AULT, Prop. **CALALLEN, TEXAS**

PRICES REDUCED

Discounts from our 1921 Red Catalog of "Falcon" Beekeepers' Supplies.

All prices given on:

Pages 1, 2, 3, 4, 5, 6, 7, 8	30% discount
Page 9	35% discount
Page 10	Less 12c per pound
Page 11	30% discount
Pages 12, 13, 14, 15, 16, 17, 18, 19, 20, 21	10% discount
Page 22	35% discount
Pages 23, 24, 25	10% discount

Distributor for the Central West

RODMAN SALES CO., GATEWAY STA., BOX 18, KANSAS CITY, MO.

W. T. Falconer Mfg. Co.

FALCONER, NEW YORK, U. S. A.

"Where the good beehives come from."

SECTIONS! SECTIONS!! SECTIONS!!!

While our present stock lasts we give the opportunity to buy No. 2 sections at a big reduction. We offer as follows:

No. 2—4¼x4¼x1⅞ 2-beeway Sections, per thousand	$8.00
No. 2—4¼x4¼x1½ Plain Sections, per thousand	7.00
No. 2—4 x5 x1⅜ Plain Sections, per thousand	7.00

We are pleased to announce a big reduction in Bee Supplies. Send us a list of the goods you wish to purchase and we will quote you our new reduced prices.

AUGUST LOTZ COMPANY, BOYD, WIS.

Quality Bee Supplies From a Reliable House

Without fear or favor I place my BEE SUPPLIES and SERVICE before you.

It is the small annoyances that often grow into disastrous results. Avoid the so-called "little losses" by using MONDENG'S goods. Quality is first—save time when you put your goods together by getting supplies that are accurately made. Service is next—no delays when bee supplies are ordered from my factory.

I am ready to meet your urgent needs. Send for my latest price-list.

Closing out all Langstroth and Wisconsin hives and supers. Also Langstroth triangular top-bar frames, and eight-frame D. T. supers for 4 x 5 sections. At cost price, write for quotations.

Charles Mondeng

146 Newton Ave. N. &
159 Cedar Lake Road.
MINNEAPOLIS, MINNESOTA.

Beeswax Wanted

In big and small shipments, to keep Buck's Weed-process foundation factory going. We have greatly increased the capacity of our plant. We are paying higher prices than ever for wax. We work wax for cash or on shares.

Root Bee Supplies

Big stock, wholesale and retail. Big catalog free.

Carl F. Buck

The Comb-foundation Specialist

AUGUSTA, KANSAS.

Established 1899.

Completely Destroys the Weed Growth

More than that, the BARKER breaks the hardest crust into a level, porous, moisture-retaining mulch — **all in the same operation.**

A ten-year-old boy can run it—do more and better work than ten men with hoes. Saves time and labor, the two big expense items.

BARKER **WEEDER, MULCHER AND CULTIVATOR**

Eight reel blades revolve against a stationary underground knife—like a lawn mower. **BEST WEED KILLER EVER USED.** Works right up to plants. Cuts runners. Aerates the soil. Has leaf guards, and shovels, for deeper cultivation—3 *garden tools in* 1.

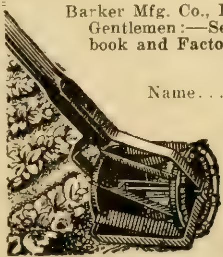
FREE ILLUSTRATED BOOK.

Tells how gardeners and fruit-growers everywhere are reducing their work; increasing their yields.—How to bring growing plants through a dry season.—How to conserve the moisture and force a larger, more rapid growth. Send TODAY for this free, illustrated book and special Factory-to-User offer.

BARKER MANUFACTURING COMPANY

Dept. 23. David City, Neb.

Barker Mfg. Co., Dept. 23, David City, Neb.
Gentlemen:—Send me postpaid your free book and Factory-to-User offer.



Name........................

Town...............

State...............

R. F. D. or Box.........

THAGARD'S ITALIAN QUEENS

BRED FOR QUALITY

My three-banded queens are bred from imported stock; they are hardy, prolific, disease-resisting and honey producers. A good queen is the life of any colony; head your colony with some of our queens, place our queens against any queens you may obtain anywhere, **and note the results.** I do not breed for **quantity,** but breed for **quality.** My queens have proven this to thousands of beekeepers that have tried them. Book your order now for July to October delivery.

July 1 to Oct. 1:	1	6	12
Untested	$1.25	$6.50	$11.50
Selected Untested	1.50	8.00	15.00
Tested	2.00	10.00	20.00
Select Tested	3.00	16.50	30.00

Safe arrival, pure mating, and perfect satisfaction guaranteed. Circular free.

V. R. THAGARD
GREENVILLE, ALABAMA

High Quality Queens at Reduced Prices

Three-banded Italians, reared from best hustlers, non-swarming, gentle, and prolific. Satisfaction guaranteed. Health certificate with each shipment.

Untested ....1 to 10, $1.00 each; over 10, $0.90 each
Select Untested ....1 to 10, 1.25 each; over 10, 1.15 each
Tested .... 1.75 each

FRANK BORNHOFFER, R. R. 17, MT. WASHINGTON, OHIO

NORMAN BROS.' QUEENS

Mr. Beekeeper, if you want good quality, quick service, prompt attention, and perfect satisfaction, TRY NORMAN BROS. pure three-banded Italians and see for yourself. We are not going to say that we have the best in U. S. A., but we do say we have as good as can be bought for the money. Our bees are hardy, gentle, prolific, disease-resisting, and honey-gatherers. Orders filled promptly by return mail or your money refunded. We guarantee pure mating, freedom from all diseases, and safe arrival in U. S. A. and Canada. Remember that you take no risk when you deal with us. Isn't that enough said?

PRICES AUGUST AND SEPTEMBER:	1	6	12	100
Untested Queen	$ .90	$5.00	$9.00	$72.00
Select Untested	1.15	6.00	11.00	85.00
Tested Queens	2.00 each			
Select Tested	3.00 each			

NORMAN BROTHERS' APIARIES - NAFTEL, ALABAMA

3-BANDED QUEENS

QUEENS OF UNSURPASSED QUALITY

GOLDEN QUEENS

Our queens are reared from selected stock taken from the best strains of Italians known. Neither trouble nor expense is spared to produce queens of unsurpassed quality. They have proved themselves to be not only great honey gatherers but also very resistant to disease, especially European foul brood. Every queen sent out by us we guarantee to give fullest satisfaction.

Price List of Our Queens:

Untested ....$1.25 each; 6 to 25, $1.10 each; 25 and up, $1.00 each
Select Untested ... 1.50 each; 6 to 25, 1.40 each; 25 and up, 1.25 each
Tested .... 2.25 each; 6 to 25, 2.10 each; 25 and up, 2.00 each
Select Tested .... 2.75 each; 6 to 25, 2.50 each; 25 and up, 2.25 each

Wings clipped free of charge. Safe arrival we guarantee. We have no disease in our apiaries.

OHIO VALLEY BEE CO., BOX 307, CATLETTSBURG, KY.

ROOT QUALITY

CANS

Screw Top—5-gallon, 1-gallon, ½-gallon, ¼-gallon.

Friction Top—2½-pound, 5-pound.

PAILS

Friction Top — 10-pound.

CARTONS

(For Comb Honey)

Folding printed for
4¼ x 4¼ x 1⅞ Sections.
4¼ x 4¼ x 1½ Sections.
4 x 5 x 1⅜ Sections.

Plain Cartons. Cartons with your address.

SHIPPING CASES

for

4¼ x 4¼ x 1⅞ Sections.
4¼ x 4¼ x 1½ Sections.
4 x 5 x 1⅜ Sections.
4¼ x 4¾ x 1⅜ Sections.
3⅝ x 5 x 1½ Sections.

GLASS

Jars—16-oz. Round, lacquered screw cap. 2 doz. in partitioned plain case.

Tumblers — 6½-oz. Slip cap with waxed liner. 4 doz. in partitioned plain case. 40 doz. in a barrel.

PRICES ARE RIGHT

But due to changing market conditions we suggest that you write for price quotations. Price inquiries on quantity lots may be wired at our expense.

THE A. I. ROOT COMPANY
MEDINA, OHIO, U. S. A.

There is a Root dealer near you.

3-BANDED Highest Quality of Italian Queens **GOLDEN**

Twenty-five years of Select Breeding from the Best

After 25 years of select breeding, not all of the time in a commercial way, but as large honey producers, therefore rearing a great number of queens for our own use, we have strains of pure Italian bees which we believe are unexcelled for honey production, disease-resisting qualities, beauty, and gentleness. Owning about 1,500 colonies of bees which we run for honey, gives us ample opportunity to test them out in every way. As our apiary interests extend as far north as northern Ontario, we test them not only for honey production but also from a climatic standpoint. We find that our bees stand the long winters there with very satisfactory results. They are very hardy and long-lived. *Listen what others say about them*:

"M. C. Berry & Co., Hayneville, Ala.: The queens I got from you have all the others skinned! They are very gentle, best of workers, and stand the long winters here finely. Other queens coming from a shorter distance do not hold a candle to them."—Gilbert Plains, Man., Canada. (Name on request.)

"M. C. Berry & Co.: I wish to inform you that one of your queens made the most honey of any in the yard. It made 250 pounds honey against an average of 103 pounds for the yard. All of your queens made good. I never have had a queen from you that did not return a big per cent on the investment."—Marion, Ind. (Name on request.)

"M. C. Berry & Co.: One of your queens built up from a nucleus and made 360 pounds of surplus honey. Enclosed find $75.00 for 50 queens. I want these for requeening European foul brood colonies as I find your stock resistant."—Troy, Pa. (Name on request.)

PRICE LIST OF OUR QUEENS.

Untested	$1.10 ea.;	6 to 50, $1.00 ea.;	50 to 100 and up, $0.90 ea.
Select Untested	1.25 ea.;	6 to 50, 1.10 ea.;	50 to 100 and up, 1.00 ea.
Tested	2.25 ea.;	6 to 50, 2.10 ea.;	50 to 100 and up, 2.00 ea.
Select Tested	2.50 ea.;	6 to 50, 2.35 ea.;	50 to 100 and up, 2.25 ea.
Breeders			$25.00 to $35.00 each.

Queens' wings clipped free of charge. Safe arrival and satisfaction guaranteed.

M. C. BERRY & CO., HAYNEVILLE, ALABAMA, U. S. A.

Make Your Bees Pay!

If you want bigger honey profits, **get the best queens you can buy.** This is the secret of successful bee-raisers. Hundreds of America's greatest honey producers order Forehand's 3-banded Italian Queens. Follow their example. Order from Forehand and be sure of satisfactory results. Backed by 28 years' successful experience in queen-breeding and honey production. Take no chances. Experimenting is costly. So certain am I that my queens will satisfy you, that I will gladly replace unsatisfactory queens delivered in U. S. or Canada, or refund your money. You be the judge and jury. Can anything be fairer?

Prices August 1st to Nov. 1st.

	1	6	12
Untested	$1.00		$10.00
Selected Untested	1.25		12.00
Tested	2.50	$13.00	24.00
Selected Tested	3.00	16.50	30.00

Bees in two-pound packages: 1 package, $6.00; 25 or over, $5.80; 50 or over, $5.40; 100 or over, $5.00, without queens.

Place your order now. Prices low, quality considered. Write for circular and discount on large orders.

N. Forehand
Ramer, Alabama

Breeder of 3-banded Italian Queens Exclusively.

SOUTHERN HEADQUARTERS

RELIABLE THREE-BANDED ITALIAN QUEENS

BY RETURN MAIL

For many years queens from our stock have been used and recommended by a number of the largest producers of honey in the U. S. and Canada. We cannot afford to disappoint them, and we will not disappoint you.
Having several hundred colonies in outyards to select the very best breeding stock from, and large well-equipped queen-rearing yards, we offer you something good.
We pay special attention to honey-gathering qualities, but do not forget gentleness, beauty, etc. The Back-lot Buzzers like them just the same as the larger producers.

PRICES NOW—Untested: 1, $1.00; 6, $5.50, 12, $10.50; 25, $20.00; 50, $38.00. Tested: 1, $1.75; 6, $10.00

Prompt service, safe arrival,
and satisfaction, we guarantee.

W. D. ACHORD, FITZPATRICK, ALABAMA

Leininger's Strain of Italian Queens

Have been carefully selected and bred for the past 38 years. Our queens are reared from selected stock taken from the best strains of Italian bees known. Neither trouble nor expense is spared to produce queens of unsurpassed quality. They have proved themselves to be not only great honey-gatherers but also very resistant to brood diseases.

We will have 400 select tested queens that we will sell as long as they will last at the folowing special prices:

PRICE LIST OF QUEENS.

Untested, $1.50 each; 6 to 25, $1.40 ea.
Sel. Tested, $3 each; 6 to 25, $2.75 ea.
Breeding queens, $10.00 each.

Every queen we send out we will guarantee to give fullest satisfaction.

FRED LEININGER & SON
DELPHOS, OHIO.

REQUEEN YOUR COLONIES

No time is better than right now to prepare for perfect wintering by requeening your colonies.
Use surplus brood for increase and give each colony of increase so made one of our young untested Italian queens.

One for..........	**$ 1.25**
Twelve for.......	**14.00**
One hundred for..	**98.75**

Write or wire for our proposition by which we furnish honey containers free and sell your crop for cash at a small charge for our selling service that sells, and ''Fosters your business.''

THE FOSTER HONEY & MERC. CO.
BOULDER, COLO.

PAILS--CANS--CASES

At greatly reduced prices. We are confident we can save western beekeepers on their requirements for all types of honey containers. Get our figures before buying.

AND---- at last, an inexpensive, but attractive advertising leaflet, bearing your apiary name, for distribution among your customers. Here is an effective means of building up a high-class retail trade. Let us send you sample, and quote.

The A. I. Root Co. of Iowa

Council Bluffs, Iowa

Queens that look like this. Bred for quality rather than quantity.

Guaranteed to give satisfaction. Prompt service, quality and mating guaranteed.

SOUTHLAND QUEENS

Three-Banded Leather-Colored Italians—Bred from Selected Root Home-Bred Breeders —Backed by Over Fifty Years in Breeding the Best Queens.

Untested	$0.75 each
Selected Untested	1.00 each
Tested	$2.00
Breeders	$5.00 to $15.00

POUND PACKAGES

Shipped on comb of fdn.

One-pound bees, no queen	$2.00
Two-pound bees, no queen	3.75
Three-pound bees, no queen	5.25

NUCLEI

One-frame, no queen	$2.00
Two-frame, no queen	3.75
Three-frame, no queen	5.25

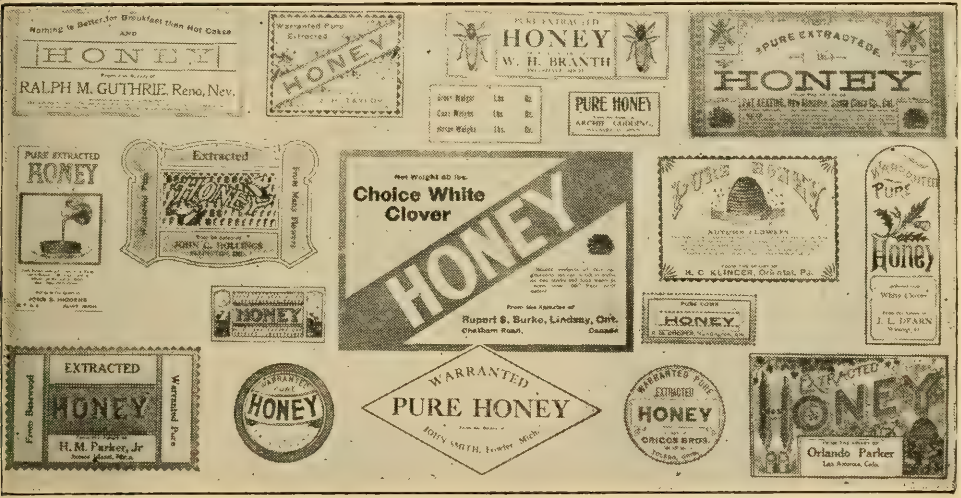
Distributors for Root Quality Bee Supplies. We are the beekeepers' bargain house. It will pay you to get our prices. Catalog on request. Shipments direct from factory at our prices.

THE SOUTHLAND APIARIES, HATTIESBURG, MISS.

PRINTED STATIONERY

THE ROOT QUALITY KIND

EVERY BEEKEEPER, EVERY FARMER—in fact, every business man—will improve his business standing with his friends and customers by using printed stationery. A nicely printed letterhead enclosed in a neatly printed envelope carries dignity with your message to your correspondent. We print just that kind of stationery. We please others, and we surely can please you. Send for sample book and prices.


Nothing is Better for Breakfast than Hot Cakes and
HONEY
RALPH M. GUTHRIE, Reno, Nev.
Warranted Pure Extracted
HONEY
PURE EXTRACTED
HONEY
W. H. BRANTH
PURE HONEY
PURE EXTRACTED
HONEY
PURE EXTRACTED
HONEY
Extracted
HONEY
JOHN C. HOLLINGS
Net Weight 60 lbs.
Choice White Clover
HONEY
Rupert S. Burke, Lindsay, Ont.
Chatham Road. Canada
H. C. KLINGER, Oriental, Pa.
HONEY
Warranted Pure
Honey
J. L. DEARN
HONEY
EXTRACTED
HONEY
From Basswood
Warranted Pure
H. M. Parker, Jr
WARRANTED PURE
HONEY
WARRANTED
PURE HONEY
JOHN SMITH, Fowler, Mich.
WARRANTED PURE
EXTRACTED
HONEY
GRIGGS BROS.
EXTRACTED
HONEY
Orlando Parker

ATTRACTIVE HONEY LABELS

WILL HELP SELL YOUR HONEY

WHEN YOU BUY PACKAGE GOODS, one of the first things to attract your eye is the label, isn't it? So it is with the other fellow. That is the big reason why your honey package should bear an attractive label. We print that kind, and at reasonable prices.

Send for a catalog showing exact reproduction of many styles of labels and the prices.

THE A. I. ROOT CO., WEST SIDE STA., MEDINA, OHIO

Honey is coming
in pretty fast now.
You are in need
of pails, cans,
shipping cases,
and cartons.

This is honey
weather all right.
Don't get left.
Send in your
order at
once.

Fine Season, Isn't It,
Mr. Beekeeper?

What can we do for you?
We can give you

Service
Quality
Promptness
Low Prices

Have you our new discount sheet?
New York State Beekeepers, write us
for same.

F. A. SALISBURY
1631 W. Genesee Street
SYRACUSE, N. Y.

Mail,
Express,
or Freight
shipments.
Write us
today.

Get our
quotations;
then send
in your
order.

The Question—

Shall I Requeen Now?

The Answer—

Authorities Urge Requeening During Late July and August---Because

—The fall queen is cheaper. Unlike an old queen, a new queen in the fall will lay well regardless of the fall honey flow. At least two full cycles of brood should be laid by the new queen, insuring a strong colony for wintering.

—Requeening means a break in egg-laying of nearly one week, with the consequent loss of brood and bees. With spring requeening this loss of bees is a real loss in honey later.

—Fall requeening brings this loss at a time when the least damage is done. Requeen now. Do not wait till spring.

—Root Queens are hardy, disease-resisting, gentle, and prolific.

QUEENS

	July-Oct.
Untested queens	$1.20
Select Untested	1.50
Tested	3.00
Select Tested	3.50

NUCLEI

(By Express)

NUCLEI—Our one, two, or three frame nuclei go out on full worker combs in wired frames, well supplied with bees and the proper amount of brood.

	Weight.	July-Oct.
1-frame Nucleus, no queen	4- 7 lbs.	$2.10
2-frame Nucleus, no queen	9-12 lbs.	3.30
3-frame Nucleus, no queen	12-16 lbs.	4.50
5-frame Nucleus, no queen	22-27 lbs.	6.30

If queen is wanted, make a selection and add her price to the above.

BEES BY THE POUND

(By Express)

	Weight	July-Sept.
1-lb. pkg. of bees, no combs	3 lbs.	$2.10
2-lb. pkg. of bees, no combs	5 lbs.	3.30
3-lb. pkg .of bees, no combs	7 lbs.	4.50

If queen is wanted, make a selection and add her price to the above.

Root
QUALITY
BEE SUPPLIES

THE A. I. ROOT COMPANY
MEDINA, OHIO, U. S. A.

A Superior Quality at Less Cost

SUPPLIES

A Superior Quality at Less Cost

All of the supply manufacturers have at last reduced their prices; but, as a beekeeper pointed out to us last month, the reduction in prices made is not nearly as great as the reduction in prices of Honey.

This is perfectly true.

Our sympathy in the campaign for low-supply prices has been entirely with the beekeeper, and a comparison of the prices as listed below will show that we can save the beekeeper money on supplies.

These supplies are made by the Diamond Match Co., and are of a superior quality.

Hives, Supers, etc., listed below are in the flat, and are complete with Hoffman frames, nails, metal rabbets, and all inside fixtures.

One-story Dovetailed Hive

Five 8-frame	$13.50
Five 10-frame	14.30

Full-depth Supers

Five 8-frame	$6.70
Five 10-frame	7.60

Shallow Extracting Supers

Five 8-frame	$5.00
Five 10-frame	5.50

No. 1 Style Comb Honey Supers

Five 8-frame	$4.80
Five 10-frame	5.25

Standard Hoffman Frames

100	$7.20
500	33.00

Our Incomparable Quality Foundation

Medium Brood	Thin Super	Light Brood
5 lbs. .74c per lb.	5 lbs. .80c per lb.	5-lb. lots 76c per lb.
25 lbs. .73c per lb.	25 lbs. .79c per lb.	25-lb. lots 75c per lb.
50 lbs. .72c per lb.	50 lbs. .78c per lb.	50-lb. lots 74c per lb.

Aluminum Honeycombs as now made by Duffy-Diehl Co. are meetwith success. We carry these in stock to supply Eastern Beekeepers.

Hoffman & Hauck, Inc.

Woodhaven, New York

Experience

is a great teacher.

Do you profit by the experience of others?

During our twenty-nine years of successful commercial queen-rearing we have helped many of America's best beekeepers find the road to success. Another improvement on your present successful plans may have a vital and valuable influence on the future course of your business, as it did on W. G. Warnock's, Proprietor of the Oakwood Poultry and Fruit farm at Geneseo, Illinois. In his last order he said:

> "The package and queens I got from you last season did finely. I divided and built up three good colonies. The queens were very prolific. In four weeks after receiving this package, they had eight frames of brood and honey. I handle them without either smoke, veil or gloves."

PRICES.

	1	6	12	100
Untested	$1.25	$ 6.50	$11.50	$0.90
Select Untested	1.50	7.50	13.50	1.00
Tested	2.00	10.00	18.50	
Select Tested..	2.75	15.00	27.00	

We guarantee pure mating and satisfaction the world over. Safe arrival in the U. S. and Canada.

W. J. Forehand & Sons
Fort Deposit, Ala.

QUEENS

Reared this season to July First, all sold and could have sold more. Why? Because the thousands we have sold must have given satisfaction.

Untested, 1 to 12 -	$1.00 each
Untested, 12 or more -	.75 each
Tested, 1 to 12 - -	2.00 each
Tested, 12 or more -	1.50 each
Breeders -	5.00 to 25.00 each

Safe arrival and satisfaction guaranteed. Return dead and unsatisfactory queens.

THE STOVER APIARIES
MAYHEW, MISS.

HUBAM

The Great Honey Bearing Clover

PRACTICAL experience with Hubam, the annual white sweet clover discovered by Prof. Hughes, is proving that it surpasses expectations in the richness of its honey-bearing content. It blooms in three to four months and continues blooming for a longer period than other honey-bearing plants.

These advantages promise to make Hubam an influence of the first importance in the business of beekeeping. It will establish a new low standard of costs and enlarged production. The use of Hubam is rapidly becoming a necessity for the successful beekeeper.

Quick growth and an unusual wealth of honey-making blooms are combined with a legume action that returns large quantities of valuable plant food to the soil.

We are large-scale growers of Hubam seed with acreages in Texas, Ohio, and North Dakota. To prevent accidental mixing of seeds we grow only Hubam clover and guarantee the purity of the seed.

Some seed of the 1921 crop is now available.

THE DE GRAFF FOOD COMPANY
Seed Department, 303
DE GRAFF, OHIO

REQUEEN

AUGUST is the month to requeen and prepare for winter as well as next year's honey crop. Desiring to secure our stock, many purchase a number of our guaranteed queens in August or September and from them select their breeder for the following season. As the prices of nearly all commodities are being reduced, we are accordingly reducing the price of our queens, this reduction to take place August first. We have sold breeding queens to many large honey producers and queen-breeders thruout the United States, Canada, and other parts of the world, and all are much pleased with our stock. A notable example of these is J. E. Wing of California, one of the largest queen-breeders and shippers of pound packages in the world. He has purchased breeders from many sources in the past and writes: "This season the Jay Smith strain has been secured, and these are equal, if not superior, to anything I ever had."

Hundreds who have purchased our guaranteed queens in the past, speak in highest terms of our stock. In the main, the reasons they give for preferring our stock are because they are gentle, they are of uniform yellow color showing good breeding, because they are excellent for eradicating European foul brood, and for the fact that the queens are large, indicating a capacity for heavy egg-production, which means strong colonies that get the big crops of honey.

Remember, I guarantee pure mating, safe arrival, and general satisfaction. I send out but one grade of queens, and that the very best I am capable of producing. If any queen should prove other than a first-class queen, I shall consider it a favor if the purchaser report the matter to me that I may have the opportunity to replace her. A card will bring our catalog.

Price list after August first: 1 to 4 inclusive, $2.00 each; 5 to 9 inclusive, $1.95 each; 10 or more, $1.90 each. Our very best breeders, $12.00 each.

JAY SMITH

ROUTE THREE, VINCENNES, INDIANA

Quality in Your Supplies Is Money in Your Pocket, Mr. Beekeeper

If you own twenty or two hundred hives, quality bee supplies will save you a very considerable amount of time thru easy handling, freedom from accidents, and freedom from breakage.

As a commercial beekeeper, we will suppose you handle two hundred colonies. For the best results you would like to examine each of your two hundred colonies every ten days during the honey flow. For success in honey production is the result of intensive and efficient management.

Root's Quality equipment in the apiary handling will save you at least one minute per hive as compared with the time necessary to handle cheaper equipment. Figuring one minute for each of two hundred colonies, the time saved totals three hours and twenty minutes each ten-day period.

This three hours and twenty minutes will provide additional time to take care of at least five additional hives. The income from these five additional hives will most certainly pay a very good return on the investment you may have in quality equipment.

To insure Root Quality our inspection force has been increased.

Save time and labor.

Complete your equipment now, and insist on your dealer furnishing Root goods.

Prices are right.

The A. I. Root Company, Medina, Ohio

There is a Root dealer near you.

Perfect Sections of Honey

are not entirely the result of perfect lumber, but depend also on the bees, the honey flow, the care of the beekeeper, and the foundation used.

* * * * *

DADANT'S FOUNDATION will aid in securing such perfect sections because it has all the qualities necessary for the most practical use, and for the most fastidious section honey producer.

* * * * *

Have you made the highest percentage of Number One Sections from your season's work? DADANT'S FOUNDATION has helped many a beekeeper add to his average.

* * * * *

Regardless of competition always the best. Tested each year in our many hundred colonies that we may help insure the most perfect work in brood-chamber or super.

* * * * *

DADANT'S FOUNDATION — Every inch, every pound, every ton equal to any sample we have ever sent out. Specify it to your dealer. If he hasn't it, write us.

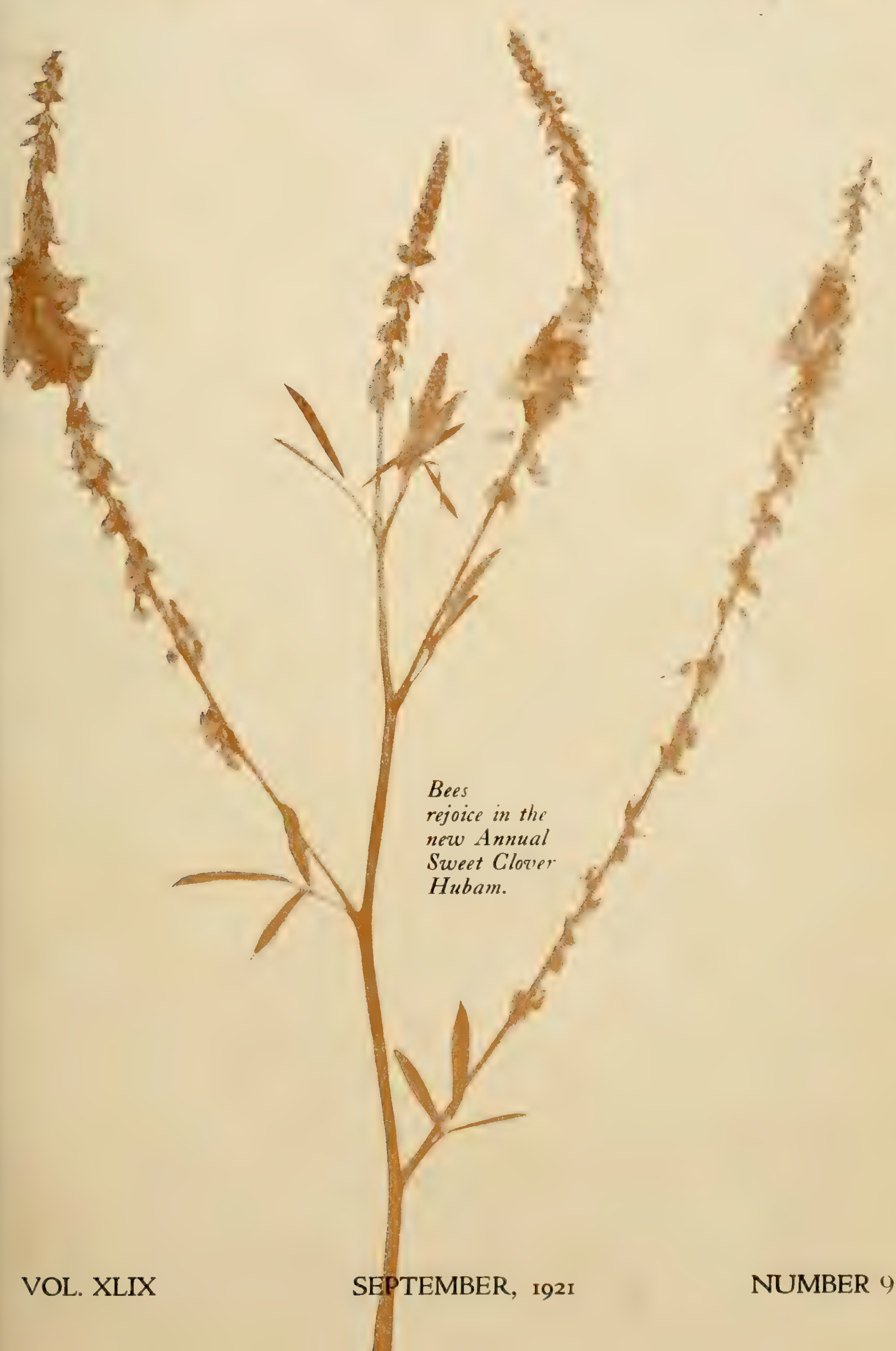
* * * * *

DADANT & SONS
HAMILTON, ILLINOIS

Catalog and Prices on Bee Supplies, Beeswax, Wax Working into Comb Foundation, and Comb Rendering for the asking.

Massachusetts
SEP 6 - 1921
Agricultural
College

Gleanings in Bee Culture



Bees rejoice in the new Annual Sweet Clover Hubam.

VOL. XLIX SEPTEMBER, 1921 NUMBER 9

Queens

We are now in a position to accept orders for queens in large quantities. Each queen selected and prepared for mailing by Henry Perkins, our Queen-breeder. They are going out in every mail, and to have yours in time to use this season, better get your order in the next mail.

Prices on bee supplies cut to pre-war time. Write for quotations.

Miller Box Manufacturing Co.
201-233 N. Avenue Eighteen
Los Angeles, Calif.

"Griggs saves you freight."

TOLEDO

By the time you read this our 1921 crop will be history. How about your Honey Cans, Comb-honey Cases, Extractors? Let us know your wants. We can serve you promptly and well.

HONEY, NEW CROP

Send sample and say how much you have, kind, how packed, and price asked in first letter.

BEESWAX ALWAYS WANTED.

THE GRIGGS BROS. CO.
Dept. 25, Toledo, Ohio.
"Griggs saves you freight."

Airco

COMB FOUNDATION

Send for a 28-page booklet recently published, which goes into details in the development of comb foundation and gives the proof of the exceptional merits of Airco Comb Foundation.

In arranging for a future supply of comb foundation you cannot afford not to investigate this product and give it a trial.

THE A. I. ROOT COMPANY
of California
52-54 Main St, San Francisco, Calif.
1824 E. 15th St., Los Angeles, Calif.

Prices on

Bees and Queens

The past month we have been from one to two thousand behind in making daily shipments on bee and queen orders. Regulations call for shipments within 24 hours after receipt of orders, but our recent discount offer on prices has overwhelmed us with orders for Root Quality Bees and Queens.

Discount prices are still in effect but the discount has been reduced from 40 per cent to 25 per cent on untested and select untested queens.

THE A. I. ROOT CO.
West Side Sta., Medina, Ohio.
Root Dealers Everywhere.

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M'n'g Editor

Honey ***Wanted*** *Honey*

We are in the market for both comb and extracted. Send sample of extracted, state how put up, with lowest price, delivered Cincinnati. Comb honey, state grade and how packed, with lowest price, delivered Cincinnati. We are always in the market for white honey, if price is right.

C. H. W. Weber & Co.
2163-65-67 Central Av., Cincinnati, Ohio

HONEY CANS

Several carloads just received at our Ogden and Idaho Falls warehouses. We also manufacture shipping cases and beehives. Special prices on request. ''Everything in Bee Supplies.'' Prompt shipments.

SUPERIOR HONEY CO., OGDEN, UTAH
(Manufacturers of Weed Process Foundation.)

WANTED---COMB HONEY

We are in the market for 10 to 20 carloads. Must be 4¼ x 4¼ x 1⅞ in beeway sections. Describe the quality, grade, and quantity, and when you will have it ready for shipment. Will take less than carload lots, if fancy and well packed in carrier. Also Extracted Honey—send sample.

HOFFMAN & HAUCK, INC., WOODHAVEN, N. Y.

Have You Sold Your Honey?

We are buying COMB and EXTRACTED honey. Send us a sample and tell us what you have to offer. Name your most interesting price delivered to Cincinnati. Remittance goes forward the day shipment is received.

Old Comb—Don't forget we render wax from your old combs and cappings. Write us for shipping tags.

* * * * * * *

We Offer You Friction-Top Cans

2½-lb. cans	$ 4.25 per 100	$ .50 per 10
5 -lb. cans	8.00 per 100	1.00 per 10
10 -lb. cans	12.00 per 100	1.40 per 10

1-lb. Round Screw Top Jars, 2 doz. in shipping case,
10-case lots..........$1.60 per case.

Prices cash with order, f. o. b. Cincinnati.

* * * * * * *

THE FRED W. MUTH CO.

Pearl and Walnut Streets. Cincinnati, Ohio.

Count on us for Prompt Service

Mail, Express or Freight

U R IN NEED

of supplies to finish up your season in good shape. Let us fill that order now.

Have you our discount sheet? New York State Beekeepers, write us for same.

F. A. SALISBURY

1631 West Genesee St., Syracuse, N. Y.

We have the goods. Try us for quality.

Write us for quotations.

HONEY MARKETS

U. S. Government Market Reports.

SHIPPING POINT INFORMATION (FIRST HALF OF AUGUST.)

CALIFORNIA POINTS.—Supplies of old crop light, of new crop moderate. Prospects are good in northern California, but in the southern part of the State the early dry spell was not compensated for by the later rains, and perhaps one-third of a crop may be looked for. Light wire inquiry. Demand and movement lighter than for previous two weeks. Market firm on white orange and white sage, mainly on account of short crop. Quotations are all on new stock. Carloads f. o. b. usual terms at loading points: white orange 9½-10c, mostly 10c; white sage 10c, light amber sage 7-7½c, white mesquite 6c, light amber alfalfa 5c. Old crop white orange low as 8c. Hawaiian, old crop practically cleaned up, new crop not ready, no sales reported. Beeswax, supplies liberal. Demand limited. Crude wax offered by dealers, 23-25c per lb.

INTERMOUNTAIN REGION.—Prospects are for an average crop on the whole, with decided variations in certain sections. In eastern Oregon and southwestern Idaho the flow did not commence until July 20, and the outlook is for not over half a crop. Demand has slightly improved and shipments are increasing. Carlots of white sweet clover are offered at 7-8c per lb., while around 12c per lb. is being secured for small lots of white alfalfa and clover.

CENTRAL STATES.—Ohio seems to enjoy about the best crop of honey in the country this year—good in quality as well as quantity. Wisconsin may have a light fall flow as a result of recent rains, but the present outlook for the State is for a 25-30 per cent crop. Colonies are breeding up to good winter strength of young bees. The drouth has also affected the crop of other northern States materially. Demand good for small lots, but slow for large lots. Extracted white clover in large lots can be bought for 7-8c per lb. f. o. b. with smaller lots ranging up to 15c per lb. Comb honey in small lots is quoted $4.00-6.00 per case. Best yellow beeswax is bringing 26c per lb. in cash or 29c per lb. in trade.

NORTHEASTERN SECTION.—Bees are in generally good condition, but the honey crop is only fair. In some important honey-producing sections of New York State the outlook is even poor, and an estimate for the State of 50 per cent is made by several observers. The drouth has also very seriously reduced the crop in Vermont.

SOUTHERN UNITED STATES.—Where recent rains have been abundant, a good fall flow is expected, but in many sections the drouth has not been much relieved by rains and little encouragement is given for the fall. Colonies are in normal condition in most districts. The crop is moving slowly: small lots of white extracted honey sell around 8-10c per lb. White heavy comb is quoted at $5.00 per 24-section case, with lighter sections at 50c less. Dark comb honey is listed around $4.00-4.50 per case.

PORTO RICO.—Offerings are said to be less plentiful, and the crop is not a large one.

MIDDLE-ATLANTIC SECTION.—Present outlook is encouraging for a large yield in Pennsylvania from buckwheat and clover. The main flow is now on. Very little stock held over from last year. Colonies in Pennsylvania are said to be in good condition.

TELEGRAPHIC REPORTS FROM IMPORTANT MARKETS.

BOSTON.—No carlot arrivals reported during past two weeks. Somewhat better local inquiry reported, principally for Porto Rico honey, supplies of which are mostly cleaned up. Bottled honey is slightly lower, and brokers' prices on l. c. l. lots of California honey are reported lower. Old crop comb honey is unchanged with little demand. Comb: Sales to retailers, old stock, New York, 24-section cases white clover No. 1 heavy $8.00-8.50, light low as $6.50. Vermont, 20-section cartons white clover No. 1, $7.00-7.75. Extracted: Sales to confectioners and bottlers, Porto Rico, amber per gal., 80-85c. California, white sage, per lb., few sales 16-18c. Brokers' l. c. l. nominal quotations delivered Boston—California, white sage 11c, amber and light amber alfalfa 6½-7½c per lb.

CINCINNATI.—One car Florida arrived during past two weeks. On account of the refusal of the principal honey and beeswax receivers to furnish the information necessary to report market conditions and prices in Cincinnati accurately and completely, no report can be published for this important honey and beeswax center.

CHICAGO.—No carlot arrivals, and l. c. l. arrivals have been light. Dealers appear to have ample supply in storage. Reports of short crop in northern States due to drouth have strengthened market somewhat. Very little f. o. b. buying reported in any section. Extracted: Local sales to bottlers and candy manufacturers, Colorado and Montana, white alfalfa 9-10c, light amber alfalfa 7-8c. Ohio, Wisconsin, and Minnesota, white clover 10-12c, mostly 10-11c. Comb: Sales to retailers, 24-section cases, Minnesota, Wisconsin, and Ohio, white clover and basswood, No. 1, $6.50-6.75; No. 2, wide range in quality, some sections very light, discolored and leaky, $3.00-5.50, mostly around $5.00. Beeswax: Receipts moderate of domestic wax, very light of foreign. European countries, particularly Germany, reported buying actively in Brazil and Central America with result market strengthening here on foreign wax, domestic market just about steady. Sales to harnessmakers, wholesale druggists or insulator manufacturers, Oklahoma, Missouri, and Colorado, light 28-32c, dark 25-28c. Foreign, few sales light 24-26c per lb.

KANSAS CITY.—No carlot arrivals since last report. Supplies light. Demand and movement light, market strong. Extracted: California, dark amber sage 8½c per lb. Comb: Missouri, 24-section cases No. 1 various flavors $6.50-7.00.

MINNEAPOLIS.—No carlot arrivals during past two weeks. Extracted: Supplies light. Practically no demand, market dull. No sales reported.

PHILADELPHIA.—Supplies are generally light and the demand is somewhat improved but very few sales are reported. Extracted: Sales to bakers, Florida, light amber various flavors bulk per gal. 60c. Beeswax: Supplies moderate, but the demand has improved and the market is firm. Sales to manufacturers, per lb. South American, crude light 25-26c, slightly darker 22-23c, African, dark 16-17c.

ST. LOUIS.—Comb: No receipts reported. Supplies light. No sales reported. Extracted: Very light receipts of new southern honey reported. Considerable stock beginning to be offered from the South, but market has very little demand and is very dull. Practically no sales. Market quoted nominally at 7-10c per lb. on southern extracted in 5-gal. cans various mixed flavors according to quality. Beeswax: Very light receipts. Demand and movement limited, market steady with unchanged prices. Sales to jobbers, southern, ungraded average country run 25c per lb.

NEW YORK.—Domestic l. c. l. receipts limited, South American and West Indian receipts light. Supplies limited. Demand limited, movement light, market dull. Extracted: Spot sales to jobbers, wholesalers, confectioners, bakers, and bottlers, domestic, per lb., California, white orange blossom 10-11½c, few high as 12c, white sage 9-10c, few high as 11c, white sweet clover 9-9½c, few 10c, light amber alfalfa 7-7½c. New York, sweet clover, few sales 8½-9c. South American and West Indian, refined per gal. best 60-65c, poorer low as 55c. Beeswax: Foreign receipts light. Supplies limited. Demand and movement limited, market dull. Spot sales to wholesalers, manufacturers, and drug trade. South American and West Indian: crude light, best 25-26c, poorer 22-24c, dark mostly 15c, few 16c. African, dark 15-16c, few high as 17c.

H. C. TAYLOR,
Chief of Bureau of Markets.

Special Foreign Quotation.

LIVERPOOL.—Little movement in honey. The price of good extracted honey, in American currency, is about eight cents a pound. The market for beeswax of the best quality is about 25 cents.

Liverpool, England, Aug. 3. Taylor & Co.

Opinions from Producers.

Early in August we sent to actual honey producers, scattered over the country, the following questions:

1. How does the total honey crop compare with normal to date in your locality? Give answer in per cent.
2. At what price is the new crop moving in large lots? Comb honey? Extracted?
3. What are prices in small lots to retailers? Comb honey? Extracted?

			Whol.Price		Ret.Price	
State.	Reported by	Crop.	Comb.	Ext.	Comb.	Ext.
Ala.	W. D. Achord...	70			$.15	$.12
Ala.	J. M. Cutts.....	40			.20	.08
Ala.	J. C. Dickman..	40			.25	.15
Ariz.	K. Ray Evans..	34		$.05		.06
Ark.	J. V. Ormond...	30			.25	
Ark.	J. Johnson......	100			.27	
Cal.	L. L. Andrews..			.09		.12
Cal.	M. A. Sayler....	75	$6.00	.06	.27	.10
Cal.	M. H. Mendleson	10		.11	.27	
Colo.	B. W. Hopper...	10	5.50	.10	6.00	.15
Conn.	Allen Latham....	90			5.50	.20
Fla.	W. Lamkin......	100		.09		.13
Fla.	H. Hewitt......	50		.12		.15
Ga.	J. J. Wilder.....	70	6.00			
Ida.	J. E. Miller.....	100		.10	.20	.13
Ill.	C. F. Bender....	25			7.00	
Ill.	A. L. Kildow...	30				
Ind.	E. S. Miller....	75			6.00	.20
Ind.	T. C. Johnson...	75			6.00	.25
Ia.	F. Coverdale....	0				
Ia.	E. G. Brown...	50		.11	6.00	.15
Ia.	W. S. Pangburn.	0		.16		
Kan.	C. D. Mize......	60			7.00	
Kan.	J. J. Nininger...	75			6.50	.15
Ky.	P. C. Ward.....	30			.25	
La.	E. C. Davis.....	90	6.00		.35	.18
Me.	O. B. Griffin....	65	.30	.20	.30	.25
Md.	S. J. Crocker, Jr..	25			.25	.17
Mass.	O. M. Smith....	50			.20	
Mass.	W. H. Wolff....	50			.37	.32
Mich.	L. S. Griggs....	75			.30	.20
Mich.	I. D. Bartlett...	50			.30	.15
Mich.	F. Markham....	100	.20	.15	.25	.20
Mich.	E. D. Townsend.	65		.13		.20
Miss.	R. B. Willson...	75	5.00	.10	.27	.17
Mo.	J. W. Romberger	20				
Mo.	J. H. Fisbeck...	60				
Neb.	F. J. Harris...	25	.21	.15	.37	.30
Nev.	L. D. A. Prince..	0	6.00	.10	6.00	.20
Nev.	T. V. Damon....	30			6.00	.14
Nev.	E. G. Norton....	20				.12
N. Y.	G. H. Rea......	40	5.75	.11	7.00	.20
N. Y.	Adams & Myers.	50			.27	.20
N. Y.	G. Howe	40	4.50		5.00	.22
N. Y.	F. W. Lesser....	85				
N. Y.	N. L. Stevens...	100		.08	4.80	.15
N. C.	C. L. Sams......	40			.23	.19
N. C.	C. S. Bumgarner.	75			.25	.15
Ohio.	R. D. Hiatt.....	133			.25	.20
Ohio.	J. F. Moore.....	100	5.00	.12	5.00	.14
Ohio.	W. A. Matheny..	90	.30	.30		
Ohio.	F. Leininger....		.20	.13	.25	.15
Okla.	C. F. Stiles.....	50			.25	.20
Okla.	J. Heneisen.....	20				
Ore.	E. J. Ladd......	45	7.75	.14	8.50	.17
Ore.	H. A. Scullen....	50	.37	.21	.30	.17
Pa.	C. N. Greene....	80	.25	.20		
Pa.	D. C. Gilham....	60			.42	.40
Pa.	H. Beaver......	80			.22	.15
R. I.	A. C. Miller.....	0			.30	.25
S. C.	R. S. Conradi...	50			.25	
Tenn.	G. M. Bentley...	100	.35	.25	.47	.35
Tenn.	J. M. Buchanan..	100		.28	.30	.25
Tex.	H. B. Parks.....	95		.08	.15	.10
Tex.	J. N. Mayes.....	60	.15	.11	.16	.12
Tex.	T. A. Bowden...	75				.16
Utah.	N. E. Miller.....	80				
Utah.	M. A. Gill.......	120	4.75			.10
Vt.	J. E. Crane......	33	8.00		8.00	.25
Va.	L. N. Gravely...	6			.30	.15
Wash.	G. W. B. Saxton.	65				.15
Wash.	G. W. York.....	75	5.50	.11		.23
W. Va.	T. K. Massie....	5			.25	
Wis.	E. Hassinger, Jr.	50		.12	.32	.19
Wis.	N. E. France....	25	.22	.15	.25	.15
Wis.	H. F. Wilson....	25		.15	.30	.20
Wyo.	A. D. Brown....	95	4.85	.11	6.00	.15

Queens, 90c and up

We are uniting our nuclei this month and are offering our QUALITY QUEENS at a price that will take them in a hurry. We guarantee these queens to be as good as you can buy elsewhere for more money than we are asking. The reason we are making such a sacrifice is because we want to get our bees in shape for winter. We will fill orders by return mail as long as our supply lasts, after that your order will be promptly returned.

Untested, 90c each, or $10.00 a dozen.
Select Unt., $1.10 each, or $13.00 a doz.
Select Tested, $2 each, or $21 a doz.

HERMAN McCONNELL, Robinson, Illinois

Seven Queens for $6.00

Pure mated, gentle, three-banded Italian Queens. Untested, $1.00 each, seven for $6.00. Select untested, $1.25 each. Tested, $1.75. *Requeen now.* Orders filled promptly.

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MASON BEE SUPPLY COMPANY
MECHANIC FALLS, MAINE

From 1897 to 1921 the Northeastern Branch of The A. I. Root Company.

PROMPT AND EFFICIENT SERVICE

BECAUSE—Only Root's Goods are sold.
It is a business with us—not a side line.
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If you have not received 1921 catalog send name at once.

MAJOR'S BRIGHT THREE-BANDED ITALIAN QUEENS ARE SELECTED.

Pure mating, safe arrival and satisfaction guaranteed. Orders filled by return mail. Queens' wings clipped according to your directions. Price: $1.50 each, or $15 per doz. Tested, $3.00 each; virgins, 50c each.

H. N. MAJOR, SOUTH WALES, N. Y.

I. F. MILLER'S STRAIN ITALIAN QUEEN BEES

Northern-bred, for business; from my best SUPERIOR BREEDERS (11 frames brood on April 7th). Gentle, roll honey in, hardy, winter well, not inclined to swarm, three-banded; 27 years' breeding experience. Satisfaction guaranteed in U. S. and Canada. 1 untested, $1.25; 6 for $7.00; 12 for $13.00; 1 select, $1.50; 6 for $8.00; 12 for $15.00; 1 tested, $2.00; 6 for $11.00; 12 for $21.00.

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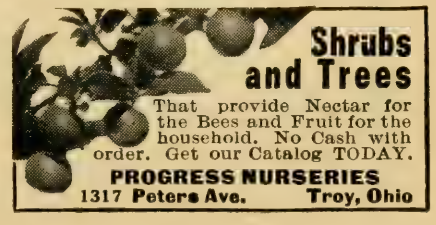
Shrubs and Trees

That provide Nectar for the Bees and Fruit for the household. No Cash with order. Get our Catalog TODAY.

PROGRESS NURSERIES
1317 Peters Ave. Troy, Ohio

PAILS--CANS--CASES

At greatly reduced prices. We are confident we can save western beekeepers on their requirements for all types of honey containers. Get our figures before buying.

AND---- at last, an inexpensive, but attractive advertising leaflet, bearing your apiary name, for distribution among your customers. Here is an effective means of building up a high-class retail trade. Let us send you sample, and quote.

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Council Bluffs, Iowa

SOUTHERN HEADQUARTERS
RELIABLE THREE-BANDED ITALIAN QUEENS
BY RETURN MAIL

For many years queens from our stock have been used and recommended by a number of the largest producers of honey in the U. S. and Canada. We cannot afford to disappoint them, and we will not disappoint you. Having several hundred colonies in outyards to select the very best breeding stock from, and large well-equipped queen-rearing yards, we offer you something good.

We pay special attention to honey-gathering qualities, but do not forget gentleness, beauty, etc. The Back-lot Buzzers like them just the same as the larger producers.

PRICES NOW—Untested: 1, $1.00; 6, $5.50, 12, $10.50; 25, $20.00; 50, $38.00. Tested: 1, $1.75; 6, $10.00

Prompt service, safe arrival,
and satisfaction, we guarantee.

W. D. ACHORD, FITZPATRICK, ALABAMA

Five-Pound and Ten-Pound Friction-Top Pails

We are naming prices below on these pails, and please note that **THESE PRICES ARE F. O. B. CARS LANSING**, and not from some distant factory point from which you will get slow delivery and high freight rates:

	25	50	100	200	500
5-lb. Friction-top pails......	$2.15	$4.10	$7.75	$15.25	$37.00
10-lb. Friction-top pails......	2.90	5.75	11.25	22.00	54.00

5-lb. pails per wooden case of 12, per case $1.35; ten cases 12.50
10-lb. pails per wooden case of 6, per case $1.05; ten cases 9.50

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Comb Honey Shipping Cases

There is an increasing interest in the production of Comb Honey, and a material reduction in price on the shipping cases. You will get better prices for your honey if put up in these attractive packages. We quote below:

	10	50	100
24-lb. four-row for 1⅞-in. sections......	$6.00	$29.00	$57.50
24-lb. four-row for 1½-in. sections......	5.85	28.35	56.00
24-lb. four-row for 4 x 5 sections........	5.85	28.35	56.00

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Paste for Tin and Glass Packages

We have a very excellent paste for fastening labels on your glassware or pails. **THEY STICK.** We are quoting prices below. Postage extra.

"A" grade paste, per pint..............................	$ .30
"A" grade paste, per quart..............................	.55
"A" grade paste, per gallon..............................	2.00

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M. H. HUNT & SON
510 North Cedar Street, Lansing, Michigan

And Now Prepare for Winter

If you will be forehanded, begin now to get your bees in shape for winter. Young queens, plenty of young bees, ample stores, and efficient protection from winter winds are acknowledged requisites.

Stores can be added by sugar later if necessary; ample protection will be your fall efforts. But young bees and plenty of them can only be secured by prolific laying of a vigorous queen in combs of worker-cells.

If you have been forehanded, you will have used DADANT'S FOUNDATION in starting your combs, thus insuring maximum results in this line.

REMEMBER: Drone comb can profitably be replaced almost any time during a honey flow by DADANT'S FOUNDATION, thus bringing your colonies to maximum producing ability.

DADANT'S FOUNDATION—Every inch, every pound, every ton, equal to any sample we have ever sent out. Specify it to your dealer. If he hasn't it, write us.

DADANT & SONS, HAMILTON, ILL.

Catalog and Prices on Bee Supplies. Beeswax, Wax Working into Comb Foundation, and Comb Rendering for the asking.

GLEANINGS IN BEE CULTURE

SEPTEMBER, 1921

The Dr. Miller Memorial Fund.

AT SOME of the field meets during the past summer some very handsome subscriptions have been received to swell the Miller memorial fund. Some organizations have sent in as high as $100. Others have contributed all the way from $25.00 to $50.00. Let the good work go on. The money can be sent in to any member of the committee or to either the American Bee Journal or Gleanings.

* * *

Big Demand for Honey Labels.

OUR honey-label department is now printing more labels for the two-and-one-half-pound tins and the five and ten pound pails than ever before in its history. This is significant and encouraging. It indicates that beekeepers are inducing their customers to buy honey in these packages. This should result in a much larger consumption of honey than would be possible when sold in smaller packages. The five-pound pail habit is a good one to encourage.

* * *

Market and Crop Conditions.

THERE IS not much new to report beyond what is given in our last issue, page 481, except that the clover crop within 200 miles of Medina was exceptionally good; but it was from fair to poor elsewhere, especially so in Minnesota and Wisconsin, that have hitherto produced so much clover honey. The failure of the southern California crop, the general shortage in some other sections of the country, and the advance in the price of sugar give rise to the hope that the bottom has at last been reached, and that the turn for the better has come. The Government market reports for some sections are beginning to show stability. This is encouraging.

The economic conditions over the country are improving. This fact will have a tendency to make a slightly better demand for honey; but retail grocers, if they have not already done so, should be willing to sell at the new or reduced prices rather than hold for those that prevailed during the war. The failure of some of these to take their losses is one reason why their honey does not move.

The advice in our last issue, to sell locally as much honey as possible, keeping it away from the large centers, is still good. Local selling will do much in advertising honey and getting it to families where it has never gone before. National advertising on the part of the large bottlers will not reach some of these.

* * *

Boost the Local Market by Live-Bee Displays.

BEEKEEPERS can very greatly stimulate the demand for honey in groceries where their honey is displayed, by putting an observatory hive of bees in the window for a few days. In connection with the bees there should be a fancy display card and nice exhibit of both comb and extracted honey in neat clean packages offered at the new reduced prices. The bees should be renewed every three days to keep them fresh. An observatory hive with bees half dead does vastly more harm than good.

If the beekeepers all over the country will use live bees to stimulate their grocery sales for the next month or six weeks, they will be surprised how they will clean up the grocery shelves of the old supply, and at the same time go a long way toward disposing of not only their crop of honey but that of their neighbors of whom they may buy.

A word of caution should be uttered against retailing honey at prices that are only slightly above jobbing or wholesale. Again, low prices on the part of even one man do a great deal of harm to the honey business. The other fellows who are trying to get fair living prices should buy him out before he ruins the market.

* * *

Farmers' Bulletin on Swarm Control.

FARMERS' BULLETIN 1198, "Swarm Control," has just been issued by the United States Department of Agriculture. This is a 48-page bulletin, with 13 illustrations, written by Geo. S. Demuth while he was connected with the Bureau of Entomology at Washington, D. C. It contains a discussion of the succession of events within the hive, which lead up to swarming, and the factors which influence the tendency to swarm, such as heredity, character of the hive and the combs, the locality, and the season.

It points out that swarming can be greatly reduced by the use of good stock, by the use of well-arranged hives, together with good combs in the brood-chamber, and by management which prevents the congestion of bees within the brood-nest. It gives directions for hiving natural swarms and managing them so that the crop of honey is not reduced when swarms issue during the honey flow. It also gives directions for anticipating swarming when operating out-apiaries or when the beekeeper is away from home during the day at swarming time. It describes simple manipulations to prevent swarming when producing extracted honey, and points out the conditions under which they may be expected to be effective.

This bulletin can now be had for the asking by writing to the Department of Agriculture. In doing this it is well to order it thru the Bee Culture Division, Bureau of Entomology, Washington, D. C.

* * *

The 1920 Census Figures.

THE BUREAU of the Census, on August 3, released preliminary figures from the 1920 census of agriculture on the number of colonies of bees and the production of honey and beeswax in the United States, with comparative figures for 1910. According to these figures the number of colonies of bees on farms on January 1, 1920, was 3,476,346 as compared with 3,445,006 in 1910, an increase of 31,340 colonies or .9%.

The States reporting the largest number of colonies on farms in 1920 were Texas with 235,111, Tennessee with 191,898, California with 180,719, North Carolina with 163,956, Illinois with 162,630, Missouri with 157,678, Kentucky with 156,889, and Alabama with 153,766. These are the only States which reported over 150,000 colonies.

The production of honey by these bees on the farms in 1919 was 55,261,552 pounds as compared with 54,814,890 pounds in 1909, an increase of .8%. California leads in the amount of honey produced in 1919 with 5,501,738 pounds, followed by Texas with 5,026,095 pounds, New York with 3,223,323 pounds, Iowa with 2,840,025 pounds, Wisconsin with 2,676,683 pounds, and Colorado with 2,493,950 pounds, these being the six States reporting more than 2,000,000 pounds.

The production of wax was 826,539 pounds in 1919 as compared with 904,867 pounds in 1909.

It is unfortunate that the Census Bureau listed only colonies of bees on farms, for by doing this they have not included the holdings of many beekeepers who live in cities and villages, as do many who are extensively engaged in honey production. The figures, therefore, represent largely the holdings of those who keep but a few colonies, which in most cases are sadly neglected, as shown by the low yield per colony. For 1919 this must have been less than 16 pounds.

As an illustration of the way it works out to list only bees on farms, the District of Columbia reported only 19 colonies for 1920 against 151 in 1910. Here the growth of the city of Washington is gradually eliminating the farms but not the bees. The editor saw nearly 200 colonies of bees within the District of Columbia in 1920. He was not hunting for apiaries, but saw only those which happened to come to his attention.

The census figures are significant, however, in that they show that bees on the farms have actually increased during the past 10 years. When noting the enormous increase in the holdings of professional beekeepers in many parts of the country during the past few years one gathers the impression that the bees of the country are passing from the hands of the small beekeeper into the hands of the extensive producer, but the census figures show about 90 per cent as many beekeepers as in 1910. Apparently the honeybee is holding its own on the farms and increasing with great rapidity in the hands of professional beekeepers.

* * *

The Silver Lining Now Appears.

IT IS impossible to estimate the enormous increase in honey production in this country during the past decade. Many producers have doubled or trebled their number of colonies within the past few years, forging ahead in production almost by leaps and bounds. During the last years of the war and up to last year the high price of sugar and the difficulties in obtaining it caused an abnormal demand for honey for manufacturing soft drinks, for making ice cream, and for many other manufacturing purposes, and at the same time the foreign demand was excessive. Under the stimulus of high prices and the good demand for honey, beekeepers everywhere have greatly increased their output, and they were, therefore, not at all prepared for the slump that came late last summer, since which time many of the outlets, thru which honey had been moving so freely, have been almost, if not entirely, closed.

The silver lining to the clouds now darkening the beekeepers' horizon is the fact that beekeepers are now being compelled to sell more of their honey locally, inducing people to eat honey who have not been eating it before. If during the coming fall and winter every beekeeper who can possibly do so will push the sale of honey locally, buying more from some other beekeeper if he runs out, we should emerge from the present situation with a greatly increased demand for honey for table use in this country. If, as a result of a campaign of selling honey locally, the American people should acquire the habit of buying honey in five-pound pails, the industry will then be ready for another era of expansion in production to supply the tables of the American people with this most wholesome sweet.

THE HUBAM SWEET CLOVER

Wonderful Possibilities of this New Annual Sweet Clover Shown at Field Meet in Newbern, Alabama

By E. R. Root

I ONCE made a catch of fish so big that when I innocently told my friends about it they showed very plainly they believed I had fallen into the error of all other amateur fishermen—that of telling a whopper. I then learned that "Truth is often stranger than fiction." Fully realizing that I have another story, just as true, I am wondering whether my friends will not think that I am telling another "whopper." Be that as it may, I only ask the skeptical to investigate.

Before I come to my story proper I should explain that it was my privilege to attend the big field meet held in the interests of this new annual sweet clover at Newbern, Ala., on July 21st last. Invitations were sent out all over the country. Notwithstanding it began to rain in the morning, something like a thousand people from all over the country attended that meet to hear Prof. Hughes and other speakers tell about sweet clover in general and Hubam in particular. No one who was present, after hearing the talks and witnessing the demonstrations, could fail to come to the conclusion that this new plant gives promise of revolutionizing agriculture in portions of the North and South where land has been worn out by continuous cropping.

In the South cotton, and in the North and West corn, have been grown so many years in succession that there is a crying need of a quick-growing legume that can be plowed under three months after it is planted. The new annual so far surpasses anything else that it will be a great boon for restoring the soil with nitrogen and humus.

Newbern is about 35 miles west of Selma, almost in the center of the Black Belt where so much sweet clover (biennial and annual) is grown, and where so much sweet clover honey is gathered. East, west, and north in this Black Belt there are thousands and thousands of acres that will grow not only all varieties of sweet clover, but white clover, alsike, and alfalfa. As soon as men of capital and men of vision in the North

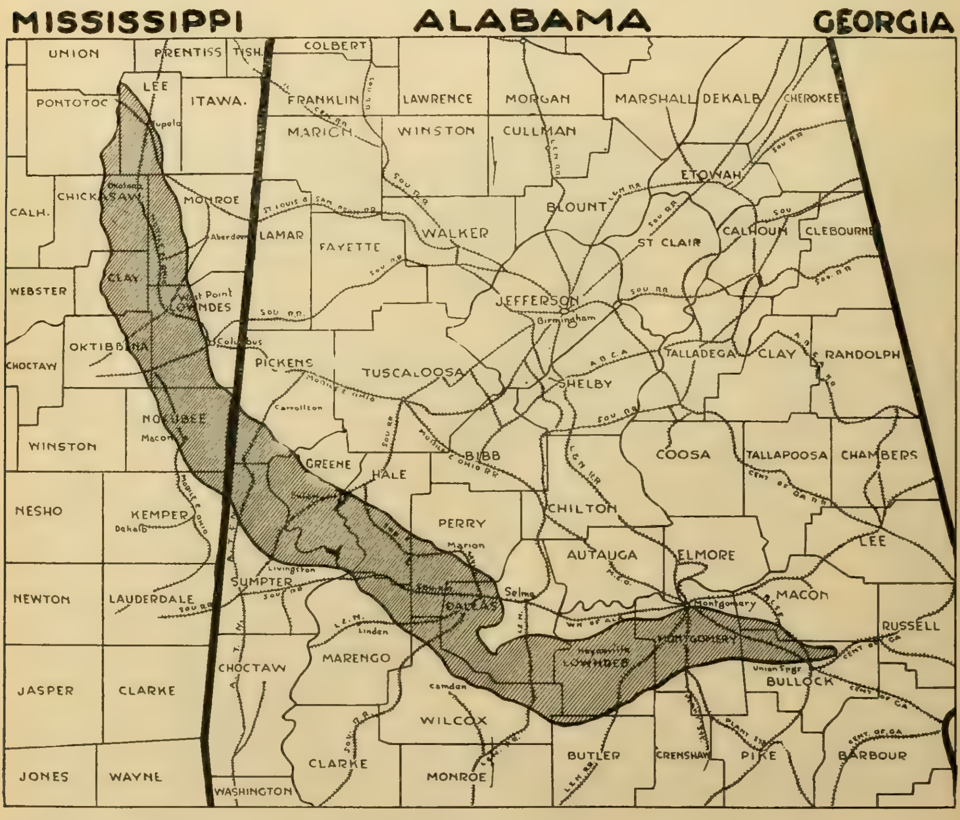
At the extreme left, the discoverer of the Hubam, Professor Hughes, addressing an audience of 1,000 people who came to hear and see him and learn something about Hubam clover.

realize what can be done in this deep rich Black Belt they will go down and help to develop it. When they do start to growing legumes this land will literally flow with milk and honey. Sweet clover, or, in a broad sense, the legumes in general, will make it possible to produce milk and butter as was never done before in the Southland. As the Black Belt is the natural habitat of the new clover, there is a possibility and even a probability that this whole area may become one of the greatest bee paradises in the world.

A partial view of the crowd listening to the speeches at the Hubam Field Day meeting.

What do I mean by the Black Belt? It is a strip of territory (see the map) approximately 25 miles wide that runs across the middle of Alabama, gradually extending northwest until it reaches the northeast part of Mississippi. The soil is deep, rich, and black, containing a large amount of lime. This black strip or belt has furnished an enormous growth of the biennial sweet clover; and it is probable that the annual sweet clover has been growing there for years. While perhaps one or two in the region realized that they had something that would mature in a year it took a man like Prof. H. G. Hughes of Ames, Iowa, to realize fully its immense economic importance to the country.

Among the experimental test-beds at the Ames College, Prof. Hughes discovered one melilotus that was head and shoulders above its neighbors. He immediately became interested; and after some inquiry he


MISSISSIPPI
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MARSHALL
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WINSTON
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LEE
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JONES
WAYNE
CLARKE
WASHINGTON
MONROE
BUTLER
CRENSHAW
PIKE
BARBOUR

Reprint from Survey of U. S. Department of Agriculture.

THE LIME LAND BELT OF ALABAMA AND MISSISSIPPI—THE GREAT LIME BELT OF THE SOUTH.

The Black Belt is a stretch of land about 25 miles wide. It runs transversely across the State of Alabama and up into the northeast of Mississippi. It contains approximately three-fourths of a million acres of rich black soil, containing a large amount of lime. It is, therefore, well adapted for the growing of legumes of all sorts, especially sweet clover and alfalfa. The Black Belt near Selma is the home of the new annual sweet clover, or Hubam, as it is called.

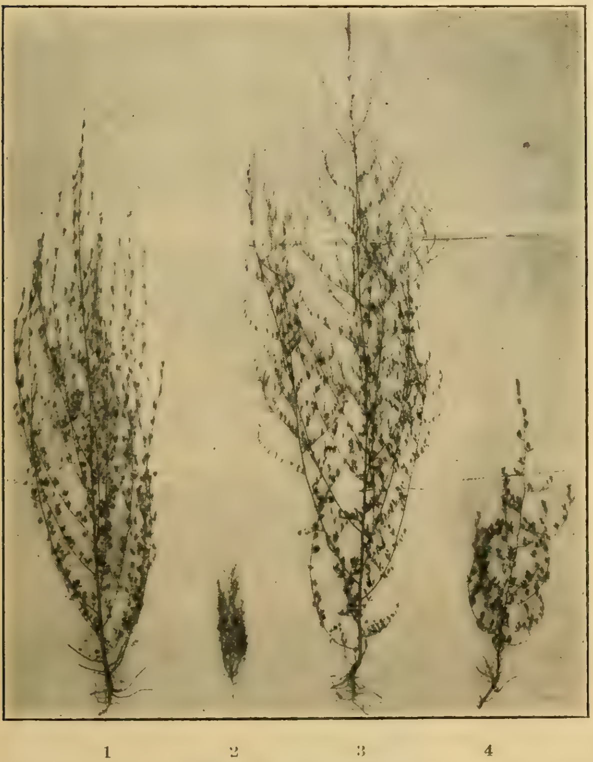
learned that its native home was in Alabama, which he soon visited. To make a long story short, the Alabama Hubam Clover Association was formed at Newbern, with Prof. H. G. Hughes as the Agricultural Adviser. This organization has now 1,200 acres growing Hubam clover seed. In spite of the floods in the spring, during which the young plants were submerged under water, and in spite of the drouth of nine weeks, this new Hubam clover has grown and flourished. Some of the members of the association have actually secured as high as $990 per acre in seed alone.

There are about 500 acres more at De Graff, Ohio; an equal acreage in Texas, Michigan, and North Dakota. While the seed has been selling for $10.00 a pound it can now be had for $2.50. The demand for it is so great that it will doubtless hold this figure for the rest of the year.

The people in this Black Belt are, of course, just discovering that they have a gold mine at present prices. There is something like three-fourths of a million acres of this land, much of it undeveloped; but the most profitable crop grown on it now is, without question, the new annual sweet clover. While I was at Newbern the clover was being cut with an ordinary grain-binder, and the seed was being gathered.

After the seed has been taken from the plants, and even tho the plants looked dry and brown, they make splendid fodder and silage. According to Prof. Bishop, one of the extension men in Alabama, who has had a wide experience with the old biennial sweet clover in Illinois, there is more actual protein in sweet clover than in alfalfa.

Prof. P. C. Bishop, formerly Field Extension Agent of Illinois and now of Alabama, making the statement that it had been discovered that white sweet clover (biennial or annual), has more of actual protein or food value than alfalfa. He explained also how sweet clover was being grown more and more in Illinois.



Courtesy Alabama Hubam Clover Association.
Nos. 1 and 2—Hubam and the annual yellow sweet clover planted the same day, cultivated and raised in the same row and under identical conditions. Nos. 3 and 4—Hubam and the old biennial sweet clover planted the same day, cultivated and raised in the same row and under identical conditions.

At the outset I said that fact is stranger than fiction. Now for the "facts."

This annual sweet clover will develop as much fodder or humus in three months as its near relative, the old biennial sweet clover, will in 21 months. In a given time, side by side in the same soil, tests made at the Ames College, in Iowa, showed that Hubam would produce by weight six times as much as the medium red clover; five times as much as the biennial yellow, and three times that of the biennial white. It has yielded slightly better than 3000 pounds of water-free material per acre.

As to honey, the Hubam clover will yield in quantity and quality as much as its near relative, the white biennial sweet clover. This is proved out in North Dakota, Ohio, and Alabama. In and around Newbern there is nothing but the new Hubam clover. Beekeepers there assure me that it produces a large amount of fine honey. Its quality, if I am any judge, is equal to that of any honey produced in the United States. More and more, bees are being moved into the sweet clover regions of Alabama, Ohio, and Michigan. At De Graff, Ohio, where there are 500 acres of this clover, we have just placed a carload of bees. It is perfectly wonderful, says our man in charge, to see how those bees are going after blossoms of this clover.

There is a feeling among the beekeepers where Hubam is growing that it is a better honey plant than the biennial because it grows so much faster.

I visited one breeder of bees in Alabama who told me he had a quantity of seed that he thought was biennial sweet clover. We went over the fields in his vicinity and found a large amount of what *I* called annual sweet clover growing wild. I said to him, "If you have the annual clover seed (and it looks as if you had) it is worth ten times the biennial melilotus."

Hubam clover is cut with an ordinary grain binder. Galvanized sheet metal is folded around the machine in such a way as to catch any loose seed that rattles out during the operation of binding.

You may imagine he became interested—just a little gold mine in his locality, and he did not know it! I would give you his name, but he is not sure that he has the annual, and neither am I. But you may rest assured be will investigate. He was going to sell his seed for approximately $2,000; but when the fact crossed his mind that the seed was actually worth ten times that amount, or $20,000, his eyes began to shine, and he spoke with a smile, "If you can find another gold mine under me I hope you will come often."

While Hubam can be grown from seed sown broadcast it is much better to plant it in rows where it can be cultivated like corn. When sown this way it takes only about three pounds of seed to the acre. If sown broadcast it would take three or four times that amount of seed, and Hubam is at present too expensive for that.

The smile that would not come off because he was one of the men who produced $990 worth per acre of Hubam clover seed near Newbern, Alabama.

The question will be asked where this seed can be grown. It will thrive wherever the ordinary white clover or white or yellow sweet clover now grows, and that means practically all over the North and West.

While it will grow where there is no lime, it will do far better where there is at least some lime in the soil.

Now, just a word about Prof. Hughes. He might have made himself a millionaire. In the course of the next 10 or 20 years he will have added millions and millions to the wealth of the land and to the farmer. After he made his great discovery of the annual sweet clover he could have sold the seed at a dollar a seed; and as the price came down he could have kept ahead and made himself more than a millionaire. Instead of this, however, he gave the seed and his discovery to the world. Modest, almost to a fault, he is the last man to sing his own praises. I tried to secure from him some data about his lifework, but not much did I get from him. He was free to tell me everything about this new sweet clover.

A Hubam clover field near Newbern, Alabama, after the binder had cut the crop.

BASIC MARKETING PRINCIPLES

Who is Responsible for Supply and Demand? Various Channels from Producer to Consumer

By H. F. Wilson

HONEY is the most wholesome sweet known to man. It is said to contain vitamines of the highest value and also small amounts of all the minerals used in the building of animal tissues. It is, therefore, unnecessary for us to defend the use of honey, but rather we should publish these facts to the world and endeavor to search out the real reason why our Creator established this food on earth. The trouble is not with honey, but rather with the present condition of the honey industry; nor do we need to worry about honey production; a plentiful supply will be brought forward when it is needed. Every person engaged in any phase of the industry must concentrate on but single ideas.

Effect of Supply and Demand.

Much has been said about marketing and distribution of honey, but there are certain fundamental factors which control the honey market.

Supply and demand are supposed to control the price of every article of commerce. To a more or less degree this is true, but in the last analysis the producer and the dealer are responsible, to the greatest extent, for the supply and demand. The general public are but the medium thru which the producer and the dealer work. The average producer of farm products has not the slightest idea as to the value of his product. He produces according to his conditions and turns his crop over to the dealer. The dealer is not concerned in the value of the crop, but rather in the per cent he may secure in handling it.

The consumer's part in the deal is more or less passive. He buys not because of necessity, for there are always satisfactory substitutes, but because there is created in his own mind a demand for a certain thing. This demand may be curtailed by inability to pay, but the number who are able to pay is always sufficiently great to carry the supply if the medium used in creating the demand is sufficiently forceful. Think of the many impractical devices each and every one of us has bought from time to time because of the forceful persuasion of some street vender.

How Much Will Consumers Pay?

Every family in the United States today is eating from one to many of our common vegetables or cereals in a new form, but changed by some manufacturing process. They pay many times the price at which they might buy the food in its best form, and frequently the more nutritive part is lost or destroyed in manufacturing. How much is honey worth as food? How much can people afford to pay for honey? I do not believe that any single person can today answer those question satisfactorily. How much will the consumer pay for honey? If we say that honey and sugar are parallel products, the consumer wants to buy honey for the same price as sugar. If we compare honey with glucose syrups, he makes the same comparison. But does honey not rank higher as a food than sugar or glucose? Honey should be classed with first-grade preserves, jams, and jellies, and should be sold on an equal price basis. Furthermore, honey should be sold on standards of quality and classified in such a way that the consumer can always buy a standard product. The great majority of people have absolutely no idea concerning the different flavors of honey, and the great conglomeration of flavors which are fed to them does not create, but rather destroys the desire for honey.

High-grade honey will sell in wholesale lots from 6 to 18 cents per pound in 1921-1922 and from 10 to 30 cents per pound retail. All grades of honey from the poorest to the best will be put on the market as honey. Those who get the poorest perhaps may never buy honey again. Those who get the best will continue to buy until they get a sample of the poorest, and they too will likely quit. There is some honey still in the hands of the beekeepers which was produced in 1920, but the crop for 1921 will be short, so that if the honey now on hand can be evenly distributed there is no need for below-cost selling. Honey is a pure sweet, and as a food is worth as much as high-class jams and jellies. The best grades of honey ought not to retail for less than 25 cents a pound in pails and not less than 35 to 45 cents in pound jars. If we figure that the average cost of production is ten cents per pound, then the retail price must be maintained near the above figures or else the large distributors will be unable to carry the business.

Function of the Middlemen.

There is always a great deal of talk about doing away with the middlemen and carrying the product from producer to consumer; but there is only one way in which the dealer can be eliminated, and that is for the beekeeper to peddle his own crop. Many beekeepers live in territory where this is impossible, and so it becomes necessary for them to sell their honey thru a dealer. Brokers, jobbers, wholesale merchants, and retailers must be paid for their efforts, and they must have a small profit in order to do business. These agencies are absolutely necessary to get distribution, and cannot be eliminated under our present marketing system. A study of the marketing problem shows that the consumer must expect to pay about 100 per cent more than the producer received. This is all charged to shipping and selling. Under these conditions if the producer received 12½ cents a pound, the retailer must receive at least 25 to 40 cents a pound in order to make a profit of from three to five per cent. Furthermore, if the beekeeper goes out and sells at 15 cents per pound retail, then he enters into direct competition with the dealer, and the dealer is forced to reduce his price, thereby lowering the price which he can afford to pay to the producer. In the end this affects the wholesale price of honey, and the beekeeper at large must expect to receive not more than seven or eight cents per pound.

Make the Industry a Big Business.

It is unnecessary to state that the honey business is suffering from lack of organization, for every one who reads this article is aware of the fact. What we need now is active participation in every legitimate co-operative movement for marketing honey. Furthermore, if none exists in your county or state, start one.

The bee industry cannot thrive on eight-cent honey, and neither can it progress as long as it continues in its present condition. What is needed is business co-operation among beekeepers—co-operative selling and standardization of grades and packages. When 50 per cent of the beekeepers in the United States can realize this and get together even in small groups, there will be some chance for the development which the bee industry deserves.

Why Not a Standard Tin Package?

The National Canners' Association has for a number of years been educating the public to buy in tin instead of glass because the tin container is much cheaper. Many of our beekeepers now prefer glass both for small packages and even for one-half gallon and gallon lots, and no doubt the glass container will always have an important place. But there are two sizes of tins which could be used to great advantage and can be made popular the country over. These are the two-pound can and five-pound pail.

The great majority of people should never be sold more than five or ten pounds of honey at one time, and frequently it would be better if it were only two pounds. Every package should contain full directions for liquefying honey, as there are thousands of houswives who have partially filled pails of candied honey on the pantry shelves and who after leaving it there for two or three years finally throw it away because they do not know how to render it suitable for table use. Of course a few use candied honey, and like it, but the great majority do not.

Both the two-pound can and the five-pound pail are easily shipped by parcel post, and, if we standardize our product so as to have it always the same, the public will quickly come to buying only in tin.

It is said that the housewife buys mostly on appearances; but this applies only to products of variable nature, and honey is certainly one of the variable products. Let her buy three packages of anything that is alike in quality, and she will continue indefinitely to buy on faith until she runs afoul of that can of dark-colored, badly flavored, or fermented honey—and then, good-bye!

It costs from 12 to 15 cents a pound to pack and sell a pound jar of honey exclusive of the cost of the honey, while it can be put up in five-pound pails for less than half that cost. The five-pound pail is today very popular in a few restricted districts, especially in the West and the Southwest. However, this size of package is not widely known in the East where most of the honey is sold, and a great deal can be accomplished in a better distribution of honey if more publicity is given to this special package. Sell a new customer who is not accustomed to honey a 60-pound can and be prepared never to sell that customer again. Sell him the 60 pounds in five-pound pails distributed over a longer period of time so that the family does not become fed up on honey, and in years to come the same customer may be developed into a sixty-pounder. What is likely to happen if you sell such a customer 60 pounds at one time? He finds himself with a big supply and starts in eating it at every meal. In a few months his appetite is glutted and he hates the sight of honey. Sell him a five-pound pail, and he eats it more slowly. When that is gone, it leaves a pleasant taste with him, and after a few weeks without honey he is ready for more.

Local Advertising.

With a little judicious advertising and and salesmanship, the producer can practically control his local market, not only with individuals but with the growers as well. Unless the producer makes more of an effort to get better local distribution, the price of honey will continue to be too low for profitable production. This price will range from six to ten cents a pound in 60-pound cans at the yard, while in the stores on the grocer's shelf it will sell for 20 to 25 cents a pound in five-pound pails. The bottler will not make the extra profit because the difference will be used up in canning and selling. In other words, the producer can earn 50 to 100 per cent more on his crop by being his own salesman, if he will use only up-to-date methods in preparing his product and getting it on the market.

Practically no information concerning honey is ever put into the hands of the public, and very little is being done to create a public demand for the best grades of honey. Every beekeeper should have a little two or four page pamphlet extolling the good things about honey, and his own brand in particular. Many attractive little cards, with a few words concerning honey, can also be provided.

Above all we should use a large attractive poster showing a picture of some kind and having honey printed in a conspicuous place on the poster in large letters. The following extracts are offered:

Something that is sweet, yet healthy. Honey, the health food.

Honey is a more healthy sweet than sugar and contains nothing that is harmful to the youngest child.

Honey, the health food. Honey is the best sweet for children; it contains vitamines.

Use more honey.

Excellent on cereals, wheat cakes, hot biscuits, coffee, ice cream, and fine for preserving fruit.

Try it!

Honey cannot spoil, it will keep forever. All pure honey will granulate in time. To liquefy, place the container in a vessel of warm water and leave it until the honey is clear. Honey should not be kept in a cold place since the cold hastens granulation.

The human body requires regularly a large amount of carbohydrates or sugars, which are taken up by the blood and distributed to the muscles where they produce energy. Honey not only supplies this need, but it also contains a number of the mineral elements essential to the body, such as calcium and phosphorus for the teeth; iron, sodium, and potassium for the blood. Most sweets are too highly refined to have these minerals. Honey is a natural sweet and not a substitute or a manufactured product. It is an easily digested sweet and is recommended by physicians for patients suffering from digestion. It is also helpful as a preventive against coughs and colds, and is a mild laxative. It has been proved that germs causing typhoid fever, dysentery, and other intestinal diseases cannot live in honey.

Madison, Wis.

SELLING HONEY AT ROADSIDES

How Tons of Honey Can be Sold at Good Prices at Little Expense

By Robinson Newcomb

PEOPLE who would buy honey, were its claims properly presented, are daily passing our homes by the thousands. Why not try to reach these thousands as they pass our doors, instead of spending time in going to their doors? Why not let them do the traveling instead of our doing it? Why not tell these people that we have honey for sale, and tell it to them in such a way that a large number of them will stop and buy?

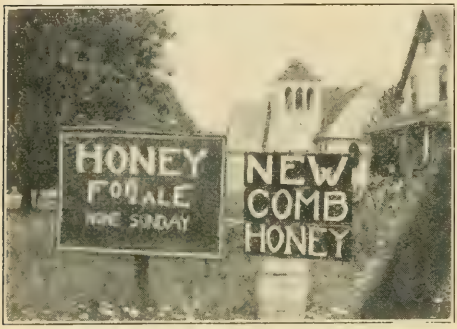
To tell those who daily pass and repass our homes that we have honey to sell, is easy. To tell them in such a way that they will stop and buy is not so easy. The motorist must know that we have honey for sale in time for him to stop his machine before getting past the house. It takes time for a motorist to make up his mind that he wants to stop and buy honey, and no motorist cares to stop suddenly. To get the largest number of machines to stop, it becomes necessary to have the signs large enough to be read at 400 feet. This necessitates having two signs, one facing up and one down the road. The signs can be read further away if the letters are white on a dark background, than if the letters themselves are dark; and it can be read later in the evening, just the time when many people are out riding. Black, dark blue, or red, and even green may be used for a background, the colors depending to some extent on the surroundings. A neat sign on the lawn will usually have a green background, while one on the road may be any of the other colors. Signs are so common now that something different is necessary, if the sign is to be really effective. For this reason a streamer across the road, or a sign suspended above the road, is more effective than a simple sign, beside the road, altho the two work to the best advantage when used together. A streamer may easily double the number of calls you will receive.

How to Make the Signs.

Signs may be bought from supply houses, or may be painted on smooth boards or on metal sheeting. Often old signs may be found and repainted. Streamers are more difficult to make. The canvas must be strengthened at the ends, so that the strain of rain and wind storms will not cause the ropes to rip out thru their fastenings; the ropes must be further apart at the supports than at the streamer, so as to keep it taut and the letters legible; the canvas must be fastened so it will not creep; the letters on one side must not show thru on the other, which usually means doubling the canvas; and the streamer must be placed so as to be low enough to be seen, but high enough to escape damage from high loads of hay.

Signs and Surroundings Should be Distinctive.

Something distinctive about the sign and the lawn will not only aid in causing the motorist to stop, but will also be a big help in bringing them back again. It is much easier for him to remember your place if there is something distinctive about it; he is much more apt to think of your honey each time he sees your distinctive features than he would be were he to see merely your sign and house; and it is much easier to direct others to you if you have something which distinguishes you from all others who have honey for sale. Two or three easily read words will differentiate one sign from another, and are enough to make one sign a sign to be remembered where another is forgotten. Too many words are to be avoided, as the motorist can not read many easily, nor would he if he could. Such words as ''Best Ever,'' ''Try It!'' ''No Sale Sunday'' may be used. Each will want to choose his own. It is not a difficult matter to get something distinctive for the lawn. In most communities it is possible to get an old skep, such as is pictured here, or some quaint hand-made hive of some sort.



White lettering on a dark background is easily read by the approaching motorist.

Signs are not the only things which help to induce the motorists to stop. Hives of bees that are visible from the road are a tremendous help. People are suspicious of extracted honey, and too often they are even suspicious of comb honey. Hives of bees that are in sight tend to inspire confidence, as well as being an added notice that we have honey to sell. If it is not possible or advisable to have bees visible from the street or close to the house, empty hives may be used instead.

People do not like to buy things about which they know but little, especially if the thing in question has a rather doubtful reputation, as honey, extracted honey especially, often has. If they are informed about honey they will be better customers. County papers are often pressed for news and welcome interesting articles from subscribers. Leaflets may be obtained from supply houses and publishers of bee journals, telling about honey, and these may be profitably given to those who stop. Propaganda of this kind will help sales at the door by increasing confidence in honey, as well as help our grocers dispose of the honey we furnish them.

Necessity of Good Salesmanship.

Getting the passing motorist to stop is less than half the battle. To be successful it is necessary to act the salesman, and sell him what he should have, and not what he thinks he wants. To make the greatest number and the largest sales, it is necessary to please him at all points, too. If the lawn is neat, and the special feature on it interesting, and if your appearance is prompt, the prospective purchaser will be pleased. He may not know it, but he is in a mood to buy more than he had planned to buy when he stopped. If he goes around to the back door, as he usually does, and finds the premises neat, we are almost sure of a sale, but we are surer of one if we meet him before he gets to the back door. The impressions he gets before meeting you count greatly for or against success.

The first question usually asked is, ''Do you have any honey?'' Sometimes it is, ''How much is your honey?'' If we are to play the salesman it is better to avoid answering this question direct. Our customer knows very little about honey; in nearly every case he does not know what kinds of flavors there are, how the honey is or should be put up, or how the quality may vary. If we answer his question at once he thinks only of the price—that is the only thing about which he can think. So we tell him briefly what kinds of honey we have, what high quality it is, and the uses of each different kind. We try to find out what kind of honey he has bought, if he has ever bought any; then we tell him how our similar kind of honey compares with what he has had, and how possibly another kind might suit him better. Finally, we tell him about the price.

Distinctive signs and surroundings help the motorist to find the right place when he comes back for more.

It is necessary to study each customer somewhat, and to be able to make a good guess at the amount of time he will be willing to give us. The talk must be varied accordingly. If the customer is sure he wants one thing, do not press another hard; but mention it, tell him you think he would very possibly like it even better than this he is getting, and tell him that if he likes this, as we know he will, to try a little of the other the next time he comes back. Try to drive home the idea, not making your attempt too apparent, that he is coming back again. If we are salesmen when we meet our customers at the door, we can sell several times what an order-taker would sell.

Customers appreciate service. If we meet them promptly, are courteous, have the change ready promptly, and give them honey done up attractively, they will leave in a more pleased and friendly frame of mind; they will leave expecting to enjoy the honey, expecting to come back again, as they probably will, especially if the quality of the honey equals the quality of the service.

Containers and Prices.

It is possible to purchase jars of all sizes, and tinted as well as clear glass jars. It hardly pays to have very small jars; the pint is small enough usually. Now and then a customer wants the "smallest you have," and if the pint is the smallest, we sell more than we would if the six-ounce jar were the smallest. Clear glass jars show up light-colored honey best. Slightly green jars may be used advantageously for honey that is very yellow, since the green glass makes yellow honey appear white.

Honey will bring as high a price if it is sold at your home as it will if sold anywhere else. Those who are able to afford a machine are willing to pay a reasonable price for what they buy. They expect to pay a good price for good articles, and too often they do not believe the article to be good unless it costs quite a good deal. If your customer pays a good price for his honey and expects the honey to be very good, he is apt to enjoy it much more than if it cost him but little, and he is more apt to come back for more. I sell more comb honey for 50 cents than I do at any other price, and my prices vary from as low as 30 cents up to 50, depending on the grade. It is not at all necessary to undersell the grocer. It will not help our sales, but it will hurt his, and it will not help to increase the respect in which honey should be held.

Old customers appreciate it if we recognize them when they come back, instead of acting as tho we had not seen them before, and telling them the same things over again that we told them the first time they came. When they come back again and again, we have an opportunity to tell them something about the bees and the honey, thus increasing their interest in honey, which they will naturally communicate to others.

One big temptation of roadside selling is the temptation to sell on Sunday. Possibly more cars pass our doors on Sunday than all the rest of the week put together, and those who pass on Sunday are more in a mood to buy than they are any other day. By actual count, 400 cars an hour pass my door Sunday afternoons. Despite this, I do not believe it pays to sell honey on Sunday.

Roadside selling has advantages over other methods, in that it brings our customers to us, saving time and strength; in that it develops the much talked of "home market"; in that it means a steady income, instead of our getting our money all in a lump. Roadside selling, further, is a big advertising work. Our signs remind passing motorists of honey day after day, bringing many to buy honey who would not otherwise ever have thought of it. Roadside selling will, however, not sell your honey without effort on your part. Like all other methods it requires headwork and salesmanship, as well as a product worth selling. With these, properly used, roadside selling will be a big help in the disposing of our crops of honey.

Brooklyn Station, Cleveland, O.

DEVELOPING LOCAL MARKETS

Reducing Cost of Marketing. Increasing Sales Thru Local Dealers. Value of Local Advertising.

By E. S. Miller

If producers generally would endeavor to sell locally as much honey as possible, it would, no doubt, largely increase consumption and relieve the congested condition of the market. Shipping to wholesale markets results in lowering the market price. There are some who argue that those who are qualified and equipped for production should specialize in that line, and that distribution should be entirely in the hands of others who by nature or otherwise are qualified as salesmen. Theoretically this is the more efficient mode of handling the business, but in practice there are some conditions which prevent the successful working out of such a system.

Great Waste in Distribution of Honey.

In the first place, there are many of our towns and smaller cities which are not adequately supplied with honey thruout the year. The same is true in many parts of the larger cities, and many people do not eat honey for the simple reason that it is seldom or never brought to their attention. Then, again, if the producer ships to the large buyer in a great commercial center, the product passes thru many hands, each handler exacting a toll, until the cost to the consumer often is two or three times the price paid the producer after he has delivered it to the wholesaler and paid the freight.

Transportation charges to and from the large cities are an important item of expense which may be eliminated by local distribution. To illustrate: We sometimes have orders for small lots of honey to be shipped to Maine, Florida, the Dakotas, and to many other distant points. Possibly the next neighbor of some of these buyers has a large quantity of honey which he would be delighted to sell at less than the cost of transportation. Honey is shipped to the far East and back again. It is shipped north and shipped south. I am wondering how much of the California honey in the New York market gets back as far as the Rocky Mountains. Not long ago I happened to come into possession of a case made to hold two 60-pound cans. The name of the producer was not on the box, nor was the name of the retailer who sold the honey to the ''ultimate consumer.'' However, there were cards and markings indicating that it had passed thru the hands of at least five dealers. Apparently it had been purchased by a dealer in the West, shipped to Chicago, thence to Michigan, thence to another point—Ohio, I think—thence back to Chicago, thence to Hammond, Ind., where it was distributed by a retail dealer.

Much of this expense and waste can and should be eliminated, and right here is an opportunity for state and national associations to render great assistance to the industry by furnishing suitable information to producers and to prospective buyers. Of course, a system for getting this information and for its distribution must first be worked out.

Grocer Does Not Create Demand. This Should Be Done by Producer.

There are many ways in which we may work a given territory for the sale of honey, say, a small city or a number of towns. Many of us do not like canvassing or peddling; besides many of us could not make a success of it if we were to try, but judicious advertising and keeping retail grocers constantly supplied will dispose of many tons of honey at a fair profit. In order to succeed in selling honey in pails thru the retail stores one must ''educate'' both the grocer and the buying public. The average grocer is not a salesman. Instead of calling attention to his goods and convincing his customer as to their merits he waits for the customer to ask for what is wanted. Instead of creating a demand he merely tries to supply a demand already existing. If you leave a dozen pails of honey he usually will put them out of sight, and on your next trip calmly inform you that he ''has no call for it.'' How shall we proceed in such a case? Well, to be successful it is important to give him some instruction in the art of selling honey. ''See here, Mr. Storekeeper, if you put that honey under the counter you'll not sell it in a thousand years. People know you have flour and potatoes, but if you sell honey it must be where they can see it. We must let them know that you have for sale Miller's honey, best in the market. Let me arrange a display and we'll see how it looks. There, doesn't that look good enough to eat? Here is a nice display card that will help to sell it. Now, Mr. S., I am going to advertise this honey in the daily papers. I'll make you a cash price 25 per cent less than the advertised retail price, and if it doesn't sell I'll take it and pay your money back. Call me up as soon as this is sold and I'll bring some more. Thank you, sir.''

Of course, some grocers, like some other people, are grouches and some won't learn; but, if you mean business and are doing business in a business way, they will not be long in coming to recognize the fact. They will no longer say, ''I'll give you so much for your stuff if you will take out in trade.'' They will ask, ''What is the price, Mr. Beeman, and at what price shall I sell it?'' There are some who are inclined to make an undue profit, but this is easily controlled by naming the retail price in your advertisements. We usually run a local ad of from three to five lines, three insertions every week or ten days, aiming to give some item of interest or information and giving something different each time. The following are examples:

Miller's Honey—Most healthful sweet. 5-pound pails only $1.25. Your grocer or phone 556R.

Honey in pails is not expensive—and it's delicious. If your grocer doesn't sell it, phone Calumet Bee Farms.

Did you ever try granulated honey? Spreads like butter. Better than candy for the children. You can get it at Bunn the Baker's.

To Obtain Free Advertising.

We have had some free advertising. We once succeeded in making friends with a reporter of one of our local daily papers, took him out to our yards, fed him up on honey, showed him the bees, how queens are reared, explained the ancestry of the drones, the process of extracting, etc., etc. Well, a two-column article on the front page, telling of the good things he saw and tasted probably added somewhat to our prestige as well as to our sales.

The best advertisement is the honey itself. For a number of years we have enjoyed a considerable mail-order trade in which cash in advance is the rule. Shipments are made by parcel post, express, and freight. A complete list of names of purchasers is kept; and a circular letter containing price list, together with a printed order blank, is sent out semiannually or oftener to our former customers. People who are pleased recommend the honey to their friends, and thus the list of purchasers grows. For mailing we prefer the 6-pound screw-top can with corrugated paper case. For local sales and for express shipments the 5-pound pail is preferable. It is not desirable to have too many kinds and sizes of containers. We have had some difficulty in shipping 10-pound pails of liquid honey for the reason that covers sometimes leak or come loose even when soldered at two or three points. We have not found it advisable to encourage consumers to buy honey in 60-pound cans, as the average family will not consume so much before becoming tired of it. It becomes granulated, is put aside, and that family seldom buys any more honey. Many would relish honey from a fresh lot, who would not eat honey from a can that has been standing around, granulated and "dug into."

Roadside Selling and Canvassing.

Along the principal highways traveled by motorists are to be found many booths and small stores where refreshments are sold. By placing suitable signs and furnishing a supply, a considerable quantity of honey may be sold to tourists. If one lives near the highway the apiary itself will furnish a good background and will convince city tourists that it is "real farmers' honey" which, next to "wild honey," is most delectable.

I have thought that a good scheme for introducing the sale of honey in a small city would be to employ one or more lady canvassers to go from house to house, taking orders, the honey to be placed in a few of the leading grocery stores and to be delivered by the grocers upon orders taken by the canvassers. In this way a thoro canvass of the city could be made. Honey as a food would be brought to the attention of the public, and the dealer would become aware that there is a "call for honey."

In delivering to retail dealers it is convenient to have a light truck, as one can deliver the goods regularly and receive cash upon delivery. If one depends on shipping, most merchants expect 30 or 60 days' credit, and it is often more difficult to collect than to make a cash sale in the first place. Then there is the boxing for shipment, which is costly in time and labor as well as in money, and the losses and delays in getting the goods delivered. A truck makes it practicable to furnish a supply of honey—comb, bottled, or in pails—to every retail dealer in foods whose business is sufficient to warrant it. Whatever plan we may pursue in disposing of the crop, I believe that, except in rare instances where we know the parties, it is important to do business on a cash basis only.

If every producer will see that his own locality is adequately and constantly supplied the present oversupply will be greatly diminished. If his crop is short let him buy from other beemen who have more than they can dispose of locally. Don't throw your crop on the wholesale market at half price unless compelled by circumstances to do so. Don't load up your retail dealer and then retail honey all about him at wholesale prices. It isn't fair. It isn't good business. A man who does this ought not to succeed—and he won't.

Valparaiso, Ind.

UNDERGROUND CELLARS

How to Build a Cancrete Bee Cellar Not Influenced by Outside Temperature Chauges

By D. L. Woodward

TWO years ago I built a concrete bee-cellar for wintering my 300 colonies of bees. At that time I was unable to get any information regarding the erection of such a cellar as I planned on building, until I learned from The A. I. Root Company that they were just completing one similar.

As first planned, I had figured on a wooden roof covered with three inches of concrete and also with earth, but the Root Company engineer advised against this. His claim was that the 6 x 6 timbers which I proposed using for rafters, with one-inch boards for roofboards, would last only a short time; and, as the three inches of concrete would not be strong enough to bear the weight of the earth above it, they would collapse sooner or later. I, therefore, changed my plans to an entire concrete cellar.

Our soil is gravelly and stony — mostly stony, I thought, from the size of the pile of stone that was taken out. After going down about five feet we encountered a vein of black building sand about two feet thru and extending the whole length of the cellar, and I was thus saved the buying and hauling of sand. I made a mistake at the start, in that I did not run my cellar far enough into the sidehill. After the excavating was done the cellar was ten feet deep at one end and three feet at the other. I figured that I would have surplus earth enough to fill this end and bring it up level with the back end; but I did not, as it took an immense amount of earth to fill in front of the front wall of the cellar. We did manage to make it go by building a wall all along the front, as you will see by the picture, to hold the earth back.

The cellar is forty feet long, nine feet wide and seven feet high, inside measurements. The walls are eight inches thick, and the flat concrete roof is eight inches thick, reinforced the short way with miniature railroad rails placed 20 inches apart and ⅜ square rods one foot apart running lengthwise. Between the rails we placed fence wire, iron rods, and any other material which we had lying around. The side walls were built first. After digging a trench about 15 inches wide and two feet deep and filling it with cobbles, we poured on a mixture of very soft cement and sand, which when hard made a good, firm foundation. Our walls were made from a one-to-three mixture of cement and sand, with stone from an old stone wall as a filler. The stone was donated by a neighbor for clean-up up the wall.

Interior view of underground concrete bee-cellar. Note the ventilating-tube extending downward from the ceiling nearly to the floor of the cellar.

How Roof Was Constructed.

After 48 hours the side walls were hard enough to allow the removal of the forms, and we erected our form for the roof. This form was constructed with the oak timbers and boards, which I originally planned to use for the roof. We placed three 6 x 6 timbers, cut to length, on end on a plank or timber so that they would not settle in the ground, one timber against each side wall and one in the middle. When we ran short of timbers we used 2 x 4's, which answered just as well. On top of these timbers we placed another timber running parallel with the under plank. After erecting these uprights about four feet apart the whole length of the cellar, we covered them with one-inch oak boards, after staying each upright to the other. We then covered the boards with one-ply tar paper, to keep the cement and water from running thru the cracks, as the boards were not matched or planed. This form was built one inch below the top of the side walls, so as to allow the railroad rails to rest on the top of the side walls and yet have concrete underneath them. In taking down the form the tar paper stuck to the concrete and still remains, as you will notice by the picture of the inside of the cellar.

After completely covering the form with concrete one inch thick and flush with the top of side walls with a mixture of one-to-three (no stone), we placed our rails crosswise and filled in between them with a mixture, using one inch crushed stone, the mixture being one part cement to three of sand and five of stone. It took four men one whole day to mix and place four inches over the entire surface. If I had realized what a mammoth job I was up against, I should by all means have had a concrete mixer. The second day we finished the roof, sloping it slightly from the center, so as to shed any water that might soak thru the ground. After bringing the concrete to the top of the rails we laid our ⅜ bars across the rails one foot apart and continued with the roof until finished. This was allowed to harden over night and then covered with one inch of building sand and sprinkled three times a day to keep the sun from drying it out too fast.

At the front of the cellar we have a four-foot vestibule with a door at each end. After letting the concrete cure for two months we took down the roof form, and with a team and scraper hauled the dirt back on the roof, and the cellar was ready for occupancy.

Ventilating System.

Our ventilation system is composed of a six-inch glazed-tile fresh-air intake, running 75 feet underground from a terrace on the street and coming in at the north end of the cellar. I inserted a six-inch elbow and two lengths of stovepipe with a damper in one length in this tile, running it to near the floor. This damper is now shut, and I get plenty of fresh air.

Near each end of the cellar in the ceiling I have a ten-inch tile running up thru the ground and covered with a concrete cap, leaving a one-inch space between the top of the tile and the cap. In the cellar I have a wooden ventilator connecting with the tile at the ceiling and reaching to within about six inches of the floor ventilators. These are also equipped with a slide to regulate the size of the opening. So far I have found it necessary to leave them both wide open.

This cellar has proved a grand success. I wintered 300 colonies in it the first winter with practically no loss, the five or six colonies that were dead in the spring being either queenless or short of stores. I was able to hold the temperature at 48 degrees with not over a half of a degree variation all winter.

Entrance to underground bee-cellar built in hillside. It would have been better to have located the cellar farther back in the hill, thus affording greater protection from outside changes in temperature.

Last fall I put my bees in the cellar on Nov. 13, in the finest condition, I think, that they ever went into winter quarters except that they had no flight. The next morning the thermometer stood at 48 degrees again,

On Dec. 28 I inspected the cellar again, and found the thermometer still at 48 and the bees quiet.

During the first winter some moisture condensed on the ceiling, but apparently it did no harm. I think it was partially due to the concrete not being thoroly dried out; so far this winter there is no moisture except near the door and around the ceiling ventilators.

I did not cement the cellar floor when I built the cellar, as I did not know how much water might come in; so I let the floor remain at it was, after leveling it and tamping it down hard with a tamper. I think now that I would rather have the dirt floor than cement, the only objection being that it is a trifle harder to clean up the dead bees in the spring.

The hives are placed in two rows, one on each side of the cellar, on 2 x 4's laid on edge on top of short pieces of 2 x 4's on edge, making them eight inches from the floor. I prefer to face them to the wall, leaving a six-inch space between the hive and the wall. They are tiered five high, one on top of the other, no tier touching the one next to it. I laid an inch strip on top of one of the 2 x 4's so as to tip the hives toward the walls a little, so that moisture can run out at the entrance and also that the dead bees may work out to some extent.

The wheelbarrow shown in front of the cellar is one of my own design and is a labor-saver. It carries three colonies very nicely, with practically no weight on the arms. While loading and unloading, the hives slant some, but are kept from sliding off by cleats; when the handles are raised the hives are perfectly level. Alighting-boards are all removed out in the yard, and very few bees attempt to leave the hive while in transit to the cellar.

In taking the bees from the cellar in the spring I like to heft each hive as it goes out. I arrange them in three sections in the yard, heavy, medium, and light; then I do not have to pay any attention to any part of the yard, except the light section, until the weather is suitable. This method saves much time in going over the whole yard and hefting each hive several times till the honey flow starts.

Clarksville, N. Y.

[The most important thing in the construction of a bee-cellar is to have it so deep in the earth or so well protected that the changes in the outside temperature do not affect the temperature within. The trouble with the ordinary cellar under the house is that it requires almost constant attention to regulate the temperature, while a cellar that is built entirely underground, as described above, should need but little, if any, attention as to temperature during the winter. Where there is a building over the cellar, similar results can be obtained by the construction which is used so successfully by David Running of Filion, Mich. In this case the cellar is dug deeper in the earth, and the ceiling is placed two or three feet below the surface of the ground outside, thus leaving a space between the ceiling of the cellar and the floor of the building above, which is partly filled with sawdust or planer shavings.—Editor.]

FROM THE FIELD OF EXPERIENCE

SELLING HONEY DIRECT

Why Price Should be Less Than Retail Price at Grocery

A beekeeper, who has sold honey direct to the consumer all his beekeeping life, great quantities of it, was asked the secret of his success.

"Pricing it right," he declared.

I was inclined to agree with him, as I thought of an incident under my observation but a short time before. A town family had a slight acquaintance with a farm family who kept 30 stands or so of bees. Mrs. Jones, the farm wife, telephoned one afternoon in early summer to Mrs. Esson, the town wife, that she had some nice strained honey for sale. "The price is 20 cents a pound," she explained, "when the customer furnishes the jar. That is for small amounts. I have half of a big five-gallon can, tho—about 30 pounds—which I would let you have for 18 cents a pound."

The town woman ordered 10 pounds, paid $2 for it, liked the honey, and thought buying direct of the producer was fine. The next day, in the corner grocery at which she traded, she noticed some strained honey, and asked the price.

"The very best grade," answered the clerk, "is 20 cents a pound, when the customer furnishes the jar."

It was a red-hot Mrs. Esson who reported the information at the supper table that night. "She didn't say so," Mrs. Esson declared, "but, of course, I supposed I was getting the honey cheaper than the stores were selling it. To charge us the full store price isn't fair. It's grabbing for the Jones family all that is saved when the two families of us cut out a middleman. The next time we buy honey, it'll be of a store, which charges us a fair price, and gives us monthly credit and delivery service. We won't bother with buying of producers who want to grab it all."

Unreasonable? The present writer isn't going to comment on that. I am not going to say either, whether Mrs. Esson's remarks were just or otherwise, when another local store, a day or two later, advertised honey by the gallon for $1.65. Certainly, a producer's 18 cents a pound looked big beside a store's 14 cents.

The point I wish to bring out, tho, and it has been confirmed by repeated happenings which have come to my notice, is that the beekeeper who wishes to build up any extensive year-after-year business with consumers, simply must see that his prices give the purchaser a saving over the local stores. I am not going to discuss here whether Mrs. Jones' 20 cents to Mrs. Esson was fair or was not—price is something it is possible to have some mighty warm squabbles over. What I do wish to bring out is that the only kind of price which is practical is the price which will build business and make profits for the producer; and that sort of price, in the case of honey, is a price somewhat lower than the retail stores charge.

The same condition, of course, applies to other farm products occasionally sold direct. In all of these, a lot of harm has been done by published matter carrying the impression that consumers are most interested in quality, and that, if the quality is right, the consumer won't balk at paying the full retail price. Such theorizing sounds all right, but my investigations indicate that it simply won't work, as the basis of a direct-to-the-consumer trade.

The gentleman who calls around at the farm, produces his bucket from the car, and buys a gallon of honey direct, may rave about the quality of honey bought from the beekeeper, and how it is like no other honey in the world. He may do this. Consumers often do. But in his heart of hearts, what matters most with this gentleman? Price. Yes, sir, price. The real cause of his satisfaction in buying direct is the cash-saving; and when that cash-saving is eliminated, the buying-direct enterprise ceases to interest him. He turns instead a crank on the subject of the unreasonableness of the pricing methods of farmers. "Help the hogs, when they want to gobble all the saving? I should say not." Like the farmer, the consumer is human.

This article is intended to be constructive. I believe a majority of beekeepers who ever have the chance to sell honey direct underestimate the necessity of correct pricing. Perhaps they feel that the buyer should pay the store price. If you can get the store price, get it, by all means. I mean, get it as the basis of a large volume of permanent trade. I don't believe it can be done. The full retail price can be obtained of an unsuspecting consumer once perhaps, but he is going to check up that price in most cases, and the next time you call, he isn't interested.

A cash-saving over the retail store will, however, interest a wide number of people. There are any number of these town families on the lookout for economies. The surprising growth of the chain stores, operated on the principle of "serve yourself, pay cash, carry away," proves this. These stores are patronized by all classes of people, a considerable number of whom could, if they preferred, buy elsewhere on weekly or monthly bill. They trade at the carry-away stores because they wish to save money.

FROM THE FIELD OF EXPERIENCE

At the prices honey is selling for this year, there is opportunity for an enormous trade direct with the consumer. It has been a great many years in most localities since the market price of honey was so low as now. This in itself is a desire-to-purchase arouser. The producer who can mention, further, that his price is a saving over local stores adds much to the appeal.

Permanent trade, the kind of patronage that comes to a beekeeper year after year with little selling effort, is what the producer most wants. A customer has to be secured in the first place, however, and energetic effort is needed.

By using the telephone, soliciting friends and acquaintances first, then the friends and acquaintances of the latter, it is possible to sell considerable quantities of honey. Postcards, with a soliciting message printed or process-typewritten, sent to a list of auto owners in a near-by city, are effective in bringing auto traffic to the farm. These should quote price, and give directions for reaching the farm. Where a carline passes the farm, newspaper advertising, small cards run the latter part of the week or Sunday, reach the general public. Some beekeepers use the want-ad column effectively in this manner.

When honey is peddled out, the best selling method I have ever seen, is selling from a wagon, on pay-day night, to industrial workers. The privilege of stationing one's wagon in a strategic spot is worth something, and some tact may be required to obtain it from the management of the manufacturing concern. If the management is progressive, however, this can be done by agreeing to sell at a certain percentage below store prices, so that the concession in reality is a clear benefit to the employees. Where the management and honey producer work together in this manner, the former will usually put a notice on its bulletin boards saying it has arranged with so-and-so to furnish employees with honey at the low price. Where the industry is large, the department to go to is the industrial-relations department, or the official who handles the subject of industrial relations.

With most producers, however, the labor required to sell a customer the first time will not make the whole transaction a bonanza, tho the price secured will be several cents better than the price buyers are paying at the stores. It is, however, a way of working harder and consequently getting more; and each year, as the same market is sold to, and as the right pricing policy is followed, the sale of the apiary output to consumer-buyers will involve less and less effort. It is the permanent customer, sold to with little effort, who makes selling honey direct attractive.

Boulder, Col. John T. Bartlett.

NEW WAY OF WINTERING

Uniting Several Colonies to Conserve Heat; Wintering without Combs

The great labor, trouble, and expense of preparing bees for winter, the amount of food used, and the uncertainties of the results long caused me to cast about for some other and perhaps better plan.

I sat down and tried to analyze the present methods. The widely varying results reported from the different methods were disconcerting and no good explanations were offered. The heavy packing plan seemed the most uniform, but the cost of cases and labor was appalling. The results were said to be the best yet. This was excellent if I could raise the money and find the labor, and as I failed to see either right at hand I pondered further.

Perhaps, after all, this system was the best for me; by keeping fewer colonies but bigger ones and running them more intensively, I could make as much and with greater certainty, so cases and thick packing were for the time held to be essential.

Cellars? The results were too irregular, the labor item was greater than cases, and all were dependent on having a suitable cellar, which I did not have.

Colony condition? The sages said big colonies of young bees with young queens. There was some cost for labor and food, but seemingly necessary with any method of successful wintering; so it only remained to find out how big a ''big'' colony is. Probably one that would fill a box, and it was so noted, but with a memo for later revision.

Food? what and how much? Some said two pounds would winter a good colony, but that it would take from 20 to 60 pounds to carry them thru the spring breeding season to the new crop. Plenty of margin for guessing there; so that was allowed to rest for further consideration.

The costs look out of all proportion to the possible, tho problematical, returns in quantity and quality of crop, without thinking of price which might, but probably would not, stay at war-time levels.

Something had to be done, but what? Get out of beekeeping and do real work, or do with the bees what the other fellows had never done? The latter appealed to me. If you don't have confidence in yourself who else will?

The answer was long in coming and looked as if it never would come; but patience and thinking, even if you are only dreaming, do bring results. One day I saw a seemingly foolish idea of wintering bees without combs, and that recalled a scheme of Dr. Phillips to winter combs without bees, buying bees and queens in the spring from the South to put on to the combs and honey carefully saved for the purpose. Mixed with those ideas was another man's scheme of wintering a few whopping big colonies and dividing them in the spring, giving each part a young queen from the South. The wheels began to turn. Bee culture had some possibilities left in it after all. I was soon as busy as a puppy with flees.

About how many "good" colonies could be combined and wintered successfully? Why not all the bees of a yard put into a specially packed room. Fine idea until I recalled that Dr. Phillips claimed the necessity of 57 varieties of heat, I mean of degrees of heat. Such a mass of bees would probably start spontaneous combustion; so I let my visions pass and got down to rational things. I finally settled on combining the bees of five colonies, basing it upon the idea that Dr. Phillips put four colonies with combs, etc., in one case, so that five without combs or brood ought to be about right.

How much food would bees so bunched need and in what form should it be? I guessed to no purpose concerning the quantity. As to form I considered liquid, either honey or syrup, or soft or hard candy, or candied honey in a division-board feeder. Candy looked the most feasible, the cheapest anyway, and all right till brood-rearing began, and then the bees would be back on their combs with honey and pollen. As hard candy was easier to make and just as good as soft, so far as I could determine from many trials of each, I decided on slabs of hard candy, and on using a ten-pound slab with glass over it and under the top packing; then I could see how they were fixed at any time and give more when needed.

The next query was a box for the bees, and what was better than a regulation body. Jumbo size? A sensible-sized case would hold it; not that the genial doctor's is other than good in its way, but it is too much in the way physically and financially.

The rest was easy—four colonies dequeened and kept so till their brood had emerged, and the queen of the fifth kept caged, and the bees prevented from raising another for the same period, when all were combined, shaken into the empty body, queen freed, candy put on top, all packed in the winter case, and what more could be asked? Well, a whole lot! I am an insatiable fellow, as you will soon see.

Bees under the described conditions will build comb, and a free queen will lay in it long before I desire any brood-rearing. If you will recall it, Dr. Phillips often gets too much brood or too many bees too early for the honey flows, which condition, tho not so bad as too late, yet is too costly, and I want to keep bees better than that and get the young bees at the psychological time.

Right here some of the rest of you may be able to help me. Can I cage the queen for the whole winter in such a colony and how? She must be able to move with the bees if they chance to cluster, and she should have access to food and not be dependent on the bees.

And again, tell me, can I safely cage several queens in one colony, each queen, of course, in her own cage, so as to have them on hand for spring when I want to divide the big colony? As I view it, the bees should have access to the queens thru excluder zinc; if so, then the queens will be dependent on the bees for food, for the bees would consume any food placed in the queen cages.

Also, will it be wise to put one or more sets of foundation in the wintering hive for the bees to work on, and will they draw it or gnaw it? It makes some difference which. Or will it be best to let them build comb in the free space of the winter body and later cut it out for wax?

Now, if some of you will just solve these latter parts of the problem, I will be greatly obliged, and—well, I'll make no rash promises. But I do feel the need of help just now, tho I may work it out myself ere long.

Providence, R. I. A. C. Miller

* * *

VERONICA OR SPEEDWELL

Is this Plant of Value as a Honey Plant where it Grows in Abundance?

I wonder if any note has ever been taken of veronica as an important plant for bees. Nectar has not been very abundant in this region. All early blossoms were destroyed. There was nothing the bees could gather from March 27 to May 10. White clover did not produce much nectar this spring. Sweet clover was good but not very abundant. Early in July I noticed my bees making a straight bee line in a southeasterly direction and this was kept up for days. I concluded the bees were working on a field of alfalfa or sweet clover. However, after several weeks, I concluded to go in search of their pasture. I found it about a mile distant—some four or five acres of old pasture land, purple with blooming veronica, or speedwell. This is a long spike which begins to bloom near the stem in a circle of flowers that gradually work outward toward the tips. The spike continues to grow in length also. Some spikes are more than one foot in length. They have been furnishing nectar for one month. I would like to know if any one has ever reported as to the value of this as a nectar plant or as regarding the quality of the honey. Hugh Miller.

Kansas City, Mo.

SIFTINGS

J. E. Crane

THE suggestion of Editor Demuth, page 510, August Gleanings, as to removing comb-honey supers, as soon as the early flow is over, is timely. I have spent the best part of the last two weeks cleaning sections, and I realize how much extra work half-filled sections or empty ones left too long on the hive make, as well as how many are ruined. By the way, I never realized before what a difference there is in different colonies in the amount of propolis they store or daub over the nice sections. I presume there is more difference in a poor season than in a good one. If the supers have on them the number of the hive from which they were taken, we may spot every colony where the bees have wasted their time gathering propolis when they might have been storing honey. Then during August we may remove their queens and replace with new young ones.

* * *

I have so far cleaned about 11,000 sections, and am surprised to see how much faster I can work than I used to. If you have a stiff short-bladed knife, an old file to keep the knife sharp, and a little oil so the propolis will not stick, you can make the work move off even if the weather is hot. Of course, the knife should be as hard as possible without being brittle.

* * *

I was especially interested in the article by A. I. Root on blueberries and huckleberries. The beauty of it is that he has not overdrawn the work that is being done along this line. I was shown photographs of some of these immense blueberries, life size, at the Department of Agriculture a year ago, and I can testify that they were whoppers.

* * *

Can it be true, as stated on page 495, that 75 per cent of city people think that honey in groceries is not real honey? If it is true, where did they get such ideas? If by reading stray paragraphs in newspapers, then let us contradict it thru the press. Unquestionably American beekeepers have a large task ahead of them, educating the great mass of our people to the purity and value of our honey.

* * *

It is doubtless true, as A. N. Clark suggests on page 495, that the granulation of honey is sometimes hastened by some in cells left over from the previous season, but we do not find much trouble from this source. If such sections are put on before a rush of honey, the cells are usually cleaned up before new honey is stored in them. However, I believe it is better to have sections, from which honey is extracted, cleaned up in the fall if it is possible. Some of the finest sections we have secured this year have been in these drawn combs. We have set some of them aside for exhibition at our county fair.

* * *

That is a right good article by E. B. Tyrrell, page 484, on ''State Fair Exhibits.'' It reminds me of an old lady who used to write before certain Bible promises ''T. and P.,'' which she said meant ''tried and proved.'' Now, this plan of the Michigan beekeepers has been tried and proved and found to be of increasing value. It shows also that the welfare of the whole is of much greater value than the success of the few. I note, too, that they are pushing the 5 and 10 pound pail. Their heads are level.

* * *

That is a delightful story written by Grace Allen on pages 500 and 501, concerning Francois Huber. How little we of today realize the hard, laborious tasks that patient studious men worked out for us during the last 200 years! Facts about bees, that seem as simple to us as our ABC's, were worked out with a great amount of labor. The same is true of chemistry and physics and other natural sciences. Rather than boast of our own success, let us remember our indebtedness to those who have gone before and done so much for us.

* * *

It does one's soul good to read the report of the unusual flow of honey in Ontario, as narrated by J. L. Byer, on page 502, while we are not getting half a crop. Well, next year it may be our turn, and those Canadians may be mourning over the failure of a crop. And yet our friend Byer does not seem to be satisfied. I am reminded of a man who lived in Philadelphia at the close of the war of 1812. He owned a boat in New York harbor. Hearing boats were in great demand, he sent his son to New York to sell the boat, setting the price at a large sum. The son sold the boat for twice what his father asked. On reporting the sale to his father the son found it hard to make him believe that so large a price had been obtained, but after counting the the money the old man was convinced. Then he broke out, ''I say, John, couldn't you have got a little more?'' Well, fun aside, it pays in beekeeping to be prepared for the extra flows to make up for the lean years.

* * *

A. C. Gilbert, East Avon, N. Y., says to wait two days after removing the old queen before introducing a ripe queen-cell. Why wait two days? We have found one day, as a rule, quite sufficient.

Beekeeping as a Side Line

Grace Allen

ON the list of flaming names that thrill the beekeepers of the world, Francois Huber (1750-1831), the blind Swiss naturalist mentioned last month, stands first. Johann Dzierzon (1811-1906), the German preacher who gave to the world the parthenogenesis of drones, is another.

Recent Scientists.

Many other investigators have discovered facts about the bees that most practical honey producers, or enthusiastic backlot beekeepers, are not equipped to discover for themselves. They have not always agreed, however. In 1883, for instance, came Schiemenz, claiming after careful research that larval food is produced by certain glands (lateral pharyngeal). Three years later came his countryman, Schonfeld, claiming that the valve at the mouth of the stomach passes forward to the oesophagus to let the contents of the stomach be ejected thru it, to be fed to the larvae. In the same year, the respected English Cheshire, in his ''Bees and Beekeeping,'' upheld Schiemenz. Then in 1904 the English Cowan and our own A. J. Cook entered the lists, each upholding Schonfeld. But in 1910, out from the Bureau of Entomology at Washington, spoke R. L. Snodgrass, in ''The Anatomy of the Honeybee,'' saying the proventriculus cannot thus pass forward without beng torn. All that the beekeeper knows is that the larvae are fed. As to the composition of this food, we have so far only von Planta's analysis of 1888; some day some one else will undertake this, with newer methods of research.

D. B. Casteel of the Bureau of Entomology has contributed studies in ''Manipulation of Wax Scales'' and ''Behavior of the Honeybee in Pollen Collecting.''

The Bureau of Entomology.

In fact, the Bureau of Entomology stands like a strong connecting link between these strictly scientific studies and the practical work of the honey producer, having issued many other bulletins, covering nearly every phase of apiculture—the winter cluster, wintering in cellars and in packing cases, foul brood, comb honey, transferring, and all such practical problems. In connection with this work there instantly flashes to every beekeeper the name of Dr. E. F. Phillips, in charge of these investigations. All reading beekeepers know and respect him. Thru his bulletins he reaches them all. Thru his book, ''Beekeeping,'' he reaches all who are interested in a splendidly organized presentation of the whole subject, at once scholarly and practical. And thru conventions and short courses, he has met and personally reached hundreds of particularly fortunate students of bee culture.

Langstroth and Quinby, Twin Giants.

The great twin giants of the nineteenth century in the beekeeping world were L. L. Langstroth and Moses Quinby. Both born in 1810, each one issued a book in 1853—books which have become classics in American beekeeping annals: ''The Hive and Honeybee'' by Langstroth, and ''Mysteries of Beekeeping Explained'' by Quinby.

Quinby gave to beekeepers not only his book, with its wealth of observation, practice, and advice, but also that most essential and useful of all apiarian tools, the bellows smoker. Langstroth gave to beekeepers not only his book, with the record of his close accurate observations of the bees, but also the movable-frame hive.

It is hard to put relative values on discoveries and inventions—but certainly there is nothing in all beekeeping progress to be placed above the movable-comb hive. Huber had really made the first; yet, tho it enabled him to make those great discoveries of the inmost secrets of the bees, for the production of honey on a large scale, they were crude to the point of impossibility. Yet in them lay the great principle. Dzierzon, also, had movable combs; yet it remained for this American preacher, L. L. Langstroth, to perfect the idea and embody it into the complete hive of today, with its unlimited power of manipulation and expansion.

How imagination likes to revive those old days! There was Langstroth playing and working with his bees—and studying them—while acting as principal of a ladies' academy in Massachusetts; and there was Quinby playing and working with his bees—and studying them—while doing cabinet work in an old mill in New York State.

While living in Philadelphia, Langstroth had read Huber. Now Langstroth was a man whose reading of Huber meant something. He was a thinker. Probably on many a rainy day he sat looking out thru a window on the quaint quiet Philadelphia of those days, building in his mind a hive like Huber's, only more so. How he must have studied his own primitive hives—''Now if I can just put each of these combs in a frame so it can be picked up and examined—and leave just the right space between for the bees.''

After going to the ladies' academy in Massachusetts, he found, up among the old hills, another young man, W. W. Cary, who had bees and also, happily, a workshop. In this shop, then, models were made of the new hive that was dreaming itself into Langstroth's brain. Till at last it was perfected. His book was published and his hive perfected when he was 43 years old; and he had done a great thing for the beekeepers of the world. Really a greater thing, probably, than most of them realize or appreciate. Can they not open their hives now and remove any comb from any part without cutting or injuring any other comb? With combs built in frames ingeniously supported, with all inside spaces figured to a nicety, Langstroth's hive has made possible the great strides in commercial beekeeping.

Quinby earned his first money when he was 18 by working in a sawmill, and with his first money he bought his first bees. From the sawmill he went on into cabinet work, making durable dignified furniture, and from his first colony of bees he went on thru 25 years of study and application, successful in spite of things, or the lack of them, until at 43 he published his book. During all those years his vision had been that of making beekeeping a worth-while industry, something men could understand and make profitable and live by. How steadily he overcame difficulties and took new steps! Instead of sulphuring his bees to take their honey, he bored holes in the tops of the hives and set boxes over them. And the bees filled them. Behold, a super. Foul brood came his way. With black bees in box hives. There were no government bulletins, either. Yet he met it, studied it, and evolved principles of treatment and control that still hold.

After publishing his book, he made beekeeping his sole means of support. Still with black bees in box hives—more than half a century ago. But soon he heard of Langstroth and his wonderful new hive. Thoroly he studied it, saw its big underlying principle and adopted it, or rather adapted it to his own ideas. He preferred and used a deeper frame. He was the first big successful honey producer, taking off tons of honey year after year. Few people realize that before 1875, the year of his death, any man had ever produced so much honey. Many people even now gasp at the mention of one ton of honey. "Why, I didn't know there was that much honey in the world," they say. Yet Moses Quinby shipped as high as 15 tons a year to New York.

He was an intensely practical man, with a big vision—a combination that always makes for success. And he was generous of his wealth of experience and learning, always teaching, telling, explaining, and imparting his own enthusiasm. Happy indeed those who knew him in his own home-loving atmosphere of bees and vineyard-terraced hillsides and fluteplaying and quiet happy life. Both Langstroth and Quinby were men of such a type that American beekeepers may well be proud of them as men. Langstroth was a preacher and Quinby was a Quaker—and the father of a preacher.

After their books were issued, in 1853, the whole beekeeping world, thrilled by the possibilities of the Langstroth hive, made one advance after another. Foundation, extractor, Italian bees—one by one these came, too. Must not these two great beekeepers have felt, in their later years, like sturdy pioneers who finally see modern industry and convenience make perfect the land where they, unaided, had hewn down forests and dug deep wells?

Doolittle and Miller.

Other loved and successful beekeeper-teachers followed. Two great recent contemporaries were G. M. Doolittle and Dr. C. C. Miller. Doolittle was the great authority on queen-rearing and bee-behavior, always an accurate observer whose statements were thoroly reliable. Dr. Miller was a great comb-honey specialist. It still seems strange, even after the passing of a year, to say *was* of Dr. Miller. Of all who have kept bees, he was somehow most particularly beloved. Most skillful and successful himself, he solved many apiarian problems for others and gave his methods and opinions freely—and most modestly—thru the bee journals. He gave of himself, too, so all who read caught glimpses of his rare, magnetic, lovable personality. Like Quinby before them, both Doolittle and Dr. Miller made their own bees most profitable.

Leaders of Today.

A. I. Root is so intimately known to readers of Gleanings that to mention him is like mentioning a friend. His vision of the commercial possibilities of standardized hives built the great A. I. Root Company, headquarters for everything in beedom, bees and queens, hives, implements and foundation, books, honey itself—and Gleanings itself, with E. R. Root as editor. He has identified the name of Root with all things apicultural. So, too, the name of Dadant, even unto the third generation, means bees, and brings to the minds of beekeepers of today the thought of big hives and foundation and the American Bee Journal—and C. P. Dadant, its editor.

Nor can this list, incomplete tho it necessarily is, reach any logical conclusion whatever without reference to Geo. S. Demuth. Mr. Demuth is another connecting link between the realm of strictly scientific investigation and profitable honey production. Associated for years with Dr. Phillips in the Bureau of Entomology, he has assisted in countless technical experiments. And he has also made a real financial success of his own bees. He is an authority on the production of comb honey. And, happily for its readers, he is one of the editors of Gleanings.

FROM NORTH, EAST, WEST AND SOUTH

In Southern California. As the season advances, the southern California beekeepers begin to realize fully just how short the honey crop actually is. Only in very rare instances has a satisfactory amount of honey been gathered.

Occasionally a beekeeper is found who reports as much as 60 pounds per colony. This is where apiaries were left last fall with a good supply of stores and plenty of young bees, and were in very favored locations in the spring. Many colonies have not only gathered no surplus honey, but also have not sufficient stores for winter. Disease is hard to control under these conditions and some loss occurs from this cause. Most beekeepers have reduced their employed help to the minimum and are curtailing expenses all they can. With all of this, the balance will be on the wrong side of the ledger for 1921.

This is discouraging, but one has only to look around at other lines of production to see in many cases a much worse condition. Many who secured but little for their deciduous fruit last year, see little to encourage them this year. Following the war, there will be a few years of readjustment of conditions thru which all of us will have to go. Of course, a failure or short crop, such as we have this year, combined with the low prices, adds to our problems. But one or two good seasons later on will accomplish wonders for us.

Very little honey is being moved and buyers are "as scarce as hen's teeth," as the saying goes. We have heard of one or two feelers to know if the producers would take eight cents for white honey, but the beekeepers think that it is worth more than that. But taking it all in all, the price never worries us half as much as the failure of a crop. A good crop, even if it is necessary to sell it at a low price, leaves the producer in splendid condition to go at it again the next year; while the short crop leaves him discouraged, and his bees are in poor condition for the following year.

Comb honey is almost an unknown quantity among the beekeepers in this part of the country. As to price, 25 to 35 cents is being asked by the retailer. This is mostly for honey produced in the east-central part of California, Utah, and Nevada. Anyone having the equipment would do well to look into this branch of the business for next year.

As we travel over the roads between our home town and the out-apiaries, we meet hundreds, yes, we might say thousands, of automobiles with bedding and camp outfit strapped to the sides. Many of these have license plates reading Oregon, Washington, Arizona, and sometimes eastern States, but the great majority carry Californians away for their summer outing. It is almost the universal thing to take a trip some time during the year, and the great majority go during the summer months. Some are bound for the mountains, and others are going to the ocean beaches where a dip in the ocean, fishing, or rolling in the sand furnishes a change and recreation. A trip adds little or nothing to one's expenses, compared with the home living expenses, for most of them go equipped to camp wherever night overtakes them. One always comes home refreshed and encouraged and much better satisfied to pitch in and make things go in the business in which he may be engaged. L. L. Andrews.

Corona, Calif.

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In Texas. Prof. S. W. Bilsing of the A. & M. College of Texas recently published an article in the Ohio Journal of Science entitled "Quantitative Studies in the Food of Spiders." This may not appear interesting to the beekeeper; but, in the investigation reported, Prof. Bilsing found that honeybees formed a part of the food of almost every species of spider studied and the bulk of the food of several. In Texas we have two species of spiders, one a large black web-building spider, the other a yellow-green flower spider, that lives almost wholly on honeybees. The beekeepers are well acquainted with the black spider as it makes its home on, or around, the hives. The yellow one is a greater pest as it exists in greater numbers; yet it is seldom seen, as it builds no web but hides in flowers. This spider lies in wait and grabs the bee as it alights on the flower. The robber throws its second pair of legs around the bee's neck and sucks the body tissues out thru the mouth parts.

The article on the time of the development of worker bees in the July Gleanings is in line with observations reported here. Here is one case which I have every reason to believe is authentic. In October and November worker bees were still emerging 31 days after the queen had been taken from the hive. In a very exact and prolonged study of the cowpea weevil and of the sweet potato weevil, made by H. J. Reinhard, Entomologist at College Station, Texas, he found that moist cool weather retarded the development of the insect and that hot dry weather shortened the periods. Queen-breeders have often told me that the period of the development of queens is 12 hours less in midsummer than in early spring.

The many friends in Texas and elsewhere will be pleased to note that E. G. LeStourgeon, nationally known among beekeepers, has been elected to the State legislature.

The weather conditions of the past month have been normal for all parts of the State. The heavy honey flow of June has been prolonged, and in many parts of the State the cotton honey flow has set in. The beekeepers are greatly surprised at the amount of the honey crop. In many sections where this spring disappearing disease almost depopulated apiaries, fair yields of honey have been taken. One well-known beekeeper reports that this disease brought down one of his outyards to an average of one frame of brood to the colony in the middle of May, and that he had given up all hope of any honey crop in this yard. He visited it on the 20th of June and found that the colonies had made an average of one super each and were in need of room. The majority of beekeepers report that there is the greatest need for careful attention just at the present time, as nearly every brood-nest is filled with honey and pollen, and almost immediate attention must be given if the colonies are to go into the winter in good condition. The prospect for a cotton flow seems good.

The annual meeting of the State Beekeepers' Association was held at College Station in connection with the Farmers' Short Course, July 26, 27. and 28. This was the 28th annual meeting of the beekeepers' organization and was one of the most interesting that has ever been held. The opening address was made by Dr. L. H. Pammell of Ames, Iowa, who recounted very briefly his experiences in Texas and told the beekeepers of the value of bees in aiding in the production of farm crops. Dr. M. C. Tanquary spoke relative to the Experiment Station and beekeeping and told of the activities of the Station during the past year. State Apiculturist Lloyd Watson briefly reviewed the behavior of bees in swarming and told of original observations made at the State Experimental Apiaries. T. W. Burleson of Waxahachie gave a detailed account of the shipping of bees in combless packages, and a very interesting discussion followed as to the handling of bees by the receiver.

State Apiary Inspector C. S. Rude gave the results of the inspection work in Texas for this year, and it was surprising to note that during the past two years the number of cases of foul brood have decreased immensely under the new policies of the inspection service. E. B. Ault told of the system and care necessary to make a success of handling bees in enormous quantities. Mr. Ault is perhaps the largest beekeeper and bee-shipper in the South. E. W. Atkins of the G. B. Lewis Company spoke on the importance to the beekeeper of using a standard equipment. W. O. Victor of Uvalde gave an outline of his annual activities in the beeyard, and called the attention of the beekeepers to the order in which these operations should be performed to get the best results at the least expenditure of time. R. R. Reppert, Extension Entomologist, called the attention of the beekeepers to the importance of extension work and asked their aid in the establishment of the office of extension apiculturist. A. H. Alex, queen-breeder of the Experiment Station Queen Yard. gave the results of his year's work in the State Queen Yard and furnished definite instructions for the raising of queens by the small beekeepers. Louis H. Scholl of Texas told of another year's experience in the use of the divisible brood-chamber and stated that he was better pleased with it than ever. H. B. Parks spoke on locality and told of the necessity of the beekeeper's studying his flora and keeping an accurate account of the blooming dates of plants. He also called attention to the fact that the Isle of Wight disease would have been explained years ago, if the beekeepers had studied locality instead of studying symptoms. He also stated that the organism causing the disease was undoubtedly a parasite on some solitary bee and had later become a parasite of the honeybee. The beekeepers were favored again this year by having Hon. W. A. Black of San Antonio present, who spoke to them briefly of their legal relationship to the community and to the State. Seventy dollars for the Miller Memorial Fund was subscribed as the last act of the meeting.

San Antonio, Tex. H. B. Parks.

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In Ontario.—The season for white honey is practically over in Ontario at this date (Aug. 8), and from reports from different points it can be said that the crop is good—possibly much above the average. Some sections, including the places where over half of our bees happen to be, have had a light crop, running around 50 pounds per colony, but other localities have had exceptionally heavy yields.

While prices are on the down grade, as was to be expected, yet from all over comes the report that the local demand for honey is very heavy. This is partly explained by the short fruit crop; but, no doubt, the common idea that honey is much cheaper this year prompts many to buy who have been purchasing little during years of higher prices.

Contrary to the expectations of most of those much interested in sugar, that commodity, a few days ago, took a rise of over a dollar a hundred at one jump. Whether this is a permanent rise or not is a question, but many, including the writer of these notes, are now wishing they had purchased sugar for winter feeding before the rise.

A lot has been said in Gleanings and other periodicals about sweet clover, both the biennial and the annual varieties. As

FROM NORTH, EAST, WEST AND SOUTH

many know, I have never been a sweet clover booster and, notwithstanding the fact that we have secured a lot of honey from this plant during last year or two, our attitude towards this plant has changed but little. I believe sweet clover has its place as a pasture plant, and particularly on light poor soil it is a great thing for enriching the land. But we live in a locality that has been noted as a grower of pure alsike seed, and from the time the farmers started to grow sweet clover I predicted that the alsike industry would be about ruined. Many who disagreed with me have now changed their minds. This year it was a rare thing to see a field of alsike or red clover that was not badly mixed with sweet clover; and sweet clover, no matter how valuable by itself, will certainly knock out the value of other clovers when mixed with them.

But I started out to tell of my limited experience with the annual and biennial varieties. This past spring I sowed some sweet clover broadcast on a very thin meadow in the first week in April on the bare stubble land, with no work following the seeding. The spring was phenomenal for growth, and in three months this biennial sweet clover had reached an average height of about three feet among the other grasses. It was cut in early July, some stocks by actual measurements showing a growth of 44 inches in the three months. Early in spring some friends in Alabama sent me a package of annual sweet clover seed, asking me to try it out. It was sown in the garden in drills, and yet at three months it was not nearly as high as the biennial variety. The only difference noticed, aside from the growth of the biennial variety, was that the annual "Hubam" was much finer in the stem and was blossoming quite a lot in three months, the biennial then showing no signs of bloom. At this date the annual is about four feet high and a mass of bloom. But I feel sure that, if the biennial had not been cut, it would be much higher than the annual is at present, as the former started a second growth after being cut for hay and is now a foot high. This is an exceptional year for growth, and another season might tell a different story.

Another matter in connection with sweet clover is that the honey is not as good as that from alsike. Some may dispute this, but 75 per cent of the users will stay with the alsike or white clover honey and tire of the sweet clover. The honey from sweet clover has a peculiar flavor, which many liken to cinnamon, and while most people like it at first taste, they soon get tired of it. Pure sweet clover is a fine bottling honey so far as color goes, and for that reason I think that it will sell right along, color having a great deal to do with the selling of honey with a great many customers.

At this date we are surrounded with the greatest acreage of buckwheat that we have ever had in the home district, and yet scarcely any honey is coming in. Following much wet weather in July, we now have dry weather and cool nights, accompanied by cool days as well. Buckwheat requires heat and moisture to yield well, and unless the weather soon changes the crop will be light in this locality. Considerable sweet clover is still coming in here, but enough buckwheat is also coming in to make the grade go as "buckwheat," even if it is 75 per cent or more sweet clover.

Colonies should go into winter quarters in good condition so far as young bees are concerned, as there has been a continual light flow in nearly all localities and queens are laying right along. There is more honey than usual in the brood-nests, so feeding will likely be a lighter job than is usually the case. J. L. Byer.

Markham, Ont.

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In Michigan.—The local price of honey seems to be whatever the buyer and seller can agree upon. The State Fair management recently asked for prices on 10,000 pounds of extracted honey. In the replies prices on extracted honey were quoted all the way from 12 cents to 25 cents per pound. This shows the diversity of opinion as to what the price is to be this year.

Prospects for a fall crop seem to be uniformly good thruout the State. Recent rains have helped the goldenrod and buckwheat greatly. Goldenrod is now (Aug. 6) yielding in the northern counties. The flow is about two weeks earlier than normal.

The summer convention of the State Beekeepers' Association was held at Alpena on August 3 and 4. Beekeepers were present from all parts of the State. The convention indorsed the proposed tariff of 2½ cents per pound, as written in the Fordney bill. All members of the association and others were urged to write to their congressman and senators, asking them to support the beekeepers in their fight for a higher duty.

There will be three beekeeping exhibits at the State Fair at Detroit on September 2-11. The extension department, under the management of Mr. Ewell, will be in the bee and honey building. The Agricultural College will have an exhibit in the building devoted to college exhibits. Apiary inspection will have an exhibit in the department of agriculture exhibit. Surely, one of these exhibits should reach most of the Fair attendants. B. F. Kindig.

East Lansing, Mich.

HEADS OF GRAIN FROM DIFFERENT FIELDS

Should Be Honey Avenue. Elston avenue, Chicago, may some day be called by a much sweeter-sounding name. This is imminent because of the honey that is being raised along both sides of this great public highway, which quite recently has been improved and is attracting heavy motor travel. Cook county beekeepers long since found the advantage of selling the products of their apiaries direct to the consumer, and they are doing it today more than ever before. This road and its tributaries invade the fifteen-thousand-acre forest preserve of Cook county. There is a wonderful variety of bloom in and out of the forest, now preserved for all time for the people. When the different tracts of land were bought to add to the preserve, many beekeeping plants were found in hiding, as it were. These are operated by private hands. Some of them are close to fine old orchards. The bees seem to have no end of fine prospects. Automobile parties stop at such apiaries and stock up their sweet supply, which turns out to be a good thing for seller and buyer. J. L. Graff.

Ravenswood, Chicago, Ill.

HONEY
FOR
SALE

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The Washboard Action of Bees I have a little comment to make on the article by Allen Latham (page 152, March, 1921, Gleanings) entitled "Washboard Actions of Bees." I do not believe that he is right in his theory that they are simply working off excess energy. After giving this peculiar action a careful study, I have come to the conclusion that the bees are simply performing necessary work of which I will speak later. As far as comparing the movements of the bees to the activity of a wild caged animal, I think he is surely mistaken. We have long recognized the fact that bees relax into semi-inactivity when the occasion requires except in the case of old bees when they need a cleansing flight.

Then what does this washboard action of bees really signify? Simply that varnishing is being done, cracks filled, and things made slick and clean. I agree with Mr. Latham that this action is more prevalent after the honey flow. I also agree with him as to the age of the bees in question, namely, those of the wax-working age. That the wax-workers are also the varnishers is a recognized fact. We find much more varnish or propolis on our sections of honey at the close of the honey flow than at a time when nectar is flowing abundantly, because at that time the wax scales are plentiful, and the builders need not resort to other substances to finish their work. At this time when comb-building should cease and varnishing begin, the bees seem to blend the two and make yellow bitter combs.

I call this peculiar washboard action a necessity, since it is their way of putting the hive into a sanitary condition, and of preparing for winter by sealing cracks and covering objectionable matter. I once laid a new piece of section near the entrance of a beehive, and before night it was covered with a thin coat of the so-called varnish. C. F. Wieneke.

Fairfax, Iowa.

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Stimulating Greater Use of Honey We increase the consumption of honey by means of printed circulars which describe the different kinds of honey, its consistency, its use as a food and medicine, and superiority over other sweets. These circulars are given out to all customers. They are also given to merchants to distribute to all purchasers. The result of this is that, during the next season, the demand for honey is usually about three times as great. This should speak for itself.

Roxbury, N. Y. M. E. Ballard.

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Color of Paint for Hives. I like red paint for painting hive bottoms, as it is cheaper and does not show the dirt so much as white. It is also fine for the inside of the cover. If I were using all tight-bottom hives I would paint all the lower body and the brood-chamber red, and keep the supers and covers white. Bees will winter 20 per cent better and average one frame of brood more in the spring in red hives than in white hives, but the red hives are hotter in summer. Chas. S. Kinzie.

Arlington, Calif.

GLEANED BY ASKING

Geo. S. Demuth

QUESTION.—What size would you advise me to build a cellar to hold 125 colonies of bees in Jumbo hives?
A. K. Karsburg.
Minnesota.

Answer. — In computing the size of the cellar to accommodate a given number of colonies a good rule is to allow two square feet of floor space for each colony. According to this rule a cellar that is to contain 125 colonies should have about 250 square feet of floor space, or, in other words, should be about 10 x 25 or 12 x 20 feet, inside measurement. Of course, a larger number of colonies can be put into a cellar of this size. Some beekeepers winter successfully by allowing but one and one-half square feet of floor space for each colony, or even less. but it is better to build the cellar too large instead of too small.

TWO COLONIES IN EACH HIVE FOR CELLAR.

Question.—My bee-yard has increased to 78 colonies, too many to go into my small cellar. Would it be well to put two colonies in each modified Dadant hive with a thin partition between, so that I would need only the room of 35 hives in the cellar?
Ohio. C. J. Appeldoorn.

Answer.—Yes, you can do this if your cellar does not get too warm. The bees will probably winter better than where there is but a single colony in each large hive if the temperature of your cellar is inclined to run too low, as most cellars do during severe winters. The greatest objection to this plan is the labor and the disturbance involved in transferring the bees to the double hives in the fall, and back into single hives again in the spring.

CRACKING NOISE IN SUPERS.

Question.—What is the cracking noise that one hears in a super when the cover is removed?
Michigan. Norman Shaw.

Answer.—You probably heard the bees gnawing the edges of the wood of the new sections or separators if in comb-honey supers. The same kind of noise can be heard when frames of foundation are given in extracting-supers.

PREVENTING GRANULATION IN BOTTLED HONEY.

Question.—If honey is slightly heated immediately after being extracted, then run into heated glass jars and sealed, is it likely to granulate? Could the jars be filled as the honey is extracted, then later put into warm water for a certain time before sealing tight to prevent granulation?
New York. Raymond Jenkins.

Answer.—Either plan will retard granulation. but the honey should be heated to about 150 degrees F. (never higher than 160 degrees F.), then sealed while hot to prevent granulation long enough for the requirements of the ordinary retail trade at the grocery. Heating the honey in a large tank before bottling is the plan usually used when a large quantity of honey is to be bottled, and heating it after it is bottled by submerging the bottles in hot water is the plan usually used when only a small lot is to be bottled. The latter plan is useful also when reliquefying honey that has granulated while standing on the grocers' shelves. When using this plan the bottles should rest upon a screen a half inch or more from the bottom of the tank, to permit a free circulation of water under them.

MAINTAINING PURITY OF ITALIANS.

Question.—How can I keep pure Italians when I have but one colony and there are black bees in another apiary only 40 rods away and wild bees in the woods? J. E. Steen.
Ohio.

Answer.—The only sure way to prevent your bees from becoming hybrids is to purchase a purely mated Italian queen from some reliable queen-breeder about every two years to supersede the old queen, for if bees are permitted to supersede their own queen, or if they rear young queens in swarming, the young queen will probably be mismated since there are no other colonies of Italians near you.

LABELING HONEY PRODUCED BY ANOTHER.

Question.—My honey labels read "Guaranteed Pure. From Vreeland Apiaries." Can I buy honey in 60-lb. tins after my own crop is sold, put it up in small packages, and use the same label, or must I state expressly that the honey was put up and not produced by myself? Everett E. Vreeland.
Massachusetts.

Answer.—The words "From Vreeland Apiaries" should be omitted from the labels used on honey which was not produced in your apiaries, since otherwise your labels would be misleading. It is not necessary to state on the label where the honey was produced. You can use the words "Put Up By," "Packed By," or simply use your own name after the word "Guaranteed Pure."

CELLAR TEMPERATURE TOO LOW AND VARIABLE.

Question.—I have a bee-cellar 12 x 16 and four feet in the ground, with concrete walls six feet high, thus extending two feet above the ground. Last winter the temperature would go as low as 32 degrees and sometimes as high as 38 degrees, but no higher. What can I do to make my cellar of a more uniform temperature of at least 40 degrees to 45 degrees? James Dearmin.
Minnesota.

Answer.—You can raise the temperature of your cellar and make it more nearly uniform by filling in with earth to the top of the wall on the outside. During the winter it may be necessary to pack straw against the lower part of the outside of the building, so that the wall is completely covered with two feet or more of straw. An exposure of two feet of wall above the ground would make a very poor bee-cellar, for it would be influenced too much by outside changes in temperature. Even when earth is banked up to the top of the wall on the outside, it is better to dig the cellar at least two feet deeper, then drop the ceiling of the cellar down two feet or more below the surface of the ground outside, filling in between the ceiling of the cellar and the floor of the building above with sawdust or forest leaves.

QUEEN LAYS EGGS THAT FAIL TO HATCH.

Question.—I had a queen that laid eggs in a normal manner, but none of her eggs ever hatched. Have you ever heard of such a thing?
Missouri. W. F. Schimmel.

Answer.—Yes, it sometimes happens thru some defect in the queen that her eggs do not hatch, altho such cases are extremely rare. The only thing that can be done in such cases is to kill the queen and introduce another.

UNSEALED HONEY FERMENTS IN CELLAR.

Question.—I stored some shallow frames of honey which were not completely sealed in the cellar, and now the unsealed portion has fermented. The cellar is damp. Was this responsible for my trouble? K. Lowder Reid.
Georgia.

Answer.—Yes, honey absorbs moisture readily, and when combs of unsealed or partly sealed honey are stored in a damp place the open cells will soon absorb enough moisture to permit fermentation. Even combs of honey that are completely sealed will in time absorb enough moisture thru the cappings, which are somewhat porous, to permit fermentation. In this case the honey expands and is forced out thru the cappings. Combs of honey should be stored in a dry place to prevent such trouble.

HOW TO TELL WORK OF LAYING WORKERS.

Question.—Today, on opening one of my hives, I found every cell in one frame had from one to ten eggs in it. Is this the work of laying workers? If so, what should I do with the colony?
Wyoming. Earl Whedon.

Answer.—More than one egg in a cell does not always indicate laying workers. Sometimes a normal queen in a weak colony may lay more eggs than the bees can care for, in which case she may place several eggs in a cell. The condition you describe, however, is no doubt the work of laying workers, for at this season the colony should be able to take care of all the eggs the queen will lay. The eggs laid by laying workers, not being fertile, will develop into drones only, and by noting the sealed brood (if it has developed that far) you can tell if it is a drone brood by the projecting cappings, which are quite different from those of worker brood. If only drone brood is present you will know that the eggs were laid either by laying workers or by a drone-laying queen, altho in the latter case the eggs should be placed more regularly. Laying workers not only lay several eggs in a cell but they place them in various positions within the cell, sometimes even on the cell wall instead of on the base, as is done by a normal queen. Frequently in the case of either laying workers or drone-laying queens much of the brood dies before it is sealed, apparently being neglected by the workers. These dead and discolored larvae resemble in appearance those dead from European foul brood, and such brood is often mistaken for this disease by beekeepers. The capping of such brood is quite irregular, there being capped cells only here and there over the combs.

Probably the best thing you can do with a colony having laying workers this late in the season is to unite it with another colony by placing its hive (without bottom) on top of the other hive (without cover), placing a sheet of newspaper between to cause them to unite peacefully. Some prefer to break up such colonies, shaking the bees from the combs upon the ground and taking the hive away. The combs may be given to other colonies. Earlier in the season or farther south even this late it is possible to save such colonies by giving them a frame or two of emerging brood and a ripe queen-cell, but it is difficult to introduce a laying queen to colonies having laying workers.

LAYING WORKERS. QUEEN LEFT IN HIVE IN SWARMING.

Question.—I had an argument with a gentleman who ridiculed the idea that worker bees ever lay eggs and that there is a queen left in the hive when a colony swarms. He agreed to leave these questions to your decision. Hugh Miller.
Missouri.

Answer.—Worker bees will lay eggs after the colony has been hopelessly queenless for some time, that is, after there are no larvae left from which a queen could be reared. The eggs laid by workers, not being fertile, produce drones only. The workers which do this are called laying workers.

When a colony casts a normal prime swarm the old queen accompanies the swarm, but in the parent colony there are several sealed queen-cells. There is no queen at large in the hive until the first of the young queens emerges, about a week after the prime swarm issued, but, of course, there are the immature young queens in the cells. When an after-swarm issues (usually seven or eight days after the prime swarm issued) one or more of the young queens accompany the swarm, usually leaving one young queen at large in the hive, the others not being permitted to leave their cells until a second after-swarm issues a day or two later.

Question.—What is the best way to unite my three-frame nuclei to make good colonies for winter.
Saskatchewan, Canada. John Telfer.

Answer.—Select two or three nuclei that are standing near each other. Remove the cover from one hive, spread a sheet of newspaper over it, punch a few pinholes thru the newspaper, then set another hive (without bottom) on top of the newspaper as a second story. This, in turn, may be prepared in the same way for a third colony.

BEES, MEN AND THINGS

(You may find it here)

"OUR early honey flow was very poor; but the situation is reversing now, and honey is coming in rapidly so that no more bees are for sale. Cotton is yielding well in many sections, and the outlook for a fall flow is good."—A. S. Conradi, Oconee County, S. C.

"As most of our honey and beeswax goes to Europe, which, I understand, is practically bankrupt, I am wondering whether it will pay to put any more time on the bees. Practically all beekeepers south of the United States are asking themselves the same thing."—Frank McCann, La Gloria, Cuba.

"This is the most disappointing year in 42. It started well, but the bees consumed all of the surplus they had stored and almost all they had in the brood-combs. Sumac flowered well but yielded poorly; however, the fall flow promises well. Colonies have been strong all season. Such is the life of the beekeeper."—Arthur C. Miller, Providence County, R. I.

"I learned last spring that when using two brood-chambers a queen will readily pass from the lower to the upper story. But so many queens will not go down into the lower body when a considerable amount of brood has hatched there. Consequently the bees will fill these combs with pollen and honey. To overcome this I exchange the two brood-chambers every week or ten days."—W. B. Erickson, Pierce County, Wis.

"It is an unwritten law with our association that no beekeeper shall place an apiary within a mile and a half of any other apiary, and all newcomers who will call on the secretary of our association will be furnished all information possible as to where a desirable location can be had if there be any within the limits of our association, which are at the present time pretty well crowded."—Gilbert Russell, Churchill County, Nev.

"There are two unusually interesting phases connected with beekeeping. One is that, if it were not for the bees that daily gather the nectar in the flowers, it would all go to waste; so the bees are wonderful conservators of a valuable natural resource. Secondly, the value of bees in the pollination of fruit and other blossoms is far greater than is the value of the honey they produce. It has been shown by Government investigation that honeybees increase the annual fruit crop at least 17% over what it would be, were it not for the work of the bees."—George W. York, Spokane County, Wash.

"One of my colonies gathered 70 pounds of clover honey in a little over five days. The clover field sounds more like a machine shop than a quiet pasture."—B. Harrison Oldson, Northampton County, Pa.

"I am trying out some 13-frame hives, and some of these have from 15 to 17 frames of brood, and brood to the top-bar as there is no honey for the bees to put there."—W. T. Rabb, Travis County, Tex.

"The honey flow started off here in good shape, but has been interfered with by rains and the flood in the Arkansas covering the the bottoms and ruining a great deal of the sweet clover."—J. C. Allen, Finney County, Kan.

"A very delicious cold drink can be made by adding four teaspoonfuls of honey to a tumbler of cold water and thoroly dissolving it. This drink is much better than it sounds. Try it."—Norman Shaw, Calhoun County, Mich.

"We have lost heavily from spray poison here in this valley. I think about half of the bees got a dose. If it had not been for this we would have had the best crop ever known here."—George W. Saxton, Yakima County, Wash.

"When the first bee comes in with the first load of pollen in the spring, she will be seen making a great fuss and shaking herself crazily. This, I believe, is to attract the bees in the hive to her load of pollen, so that they in turn will follow this bee outside to the source of supply. Practically no attention is paid to these antics when pollen is coming in freely."—J. H. Fisbeck, St. Louis County, Mo.

"In making the 'push-in-the-comb' cages why cut out the corners as given in directions in the A B C and X Y Z of Bee Culture? Don't do it—make the cuts only on the sides and after bending down, bend the ends over the sides. Try it and see. In introducing over 200 queens this season there was not a single loss when using the push-in-the-comb plan. I want no escort bees in the cage, and it has been bothersome to get them out before the queen was run in the wire cage. Try this: Make a sleeve of zinc excluder the shape and length of the mailing cage, which permits the mailing cage to slip in readily. Loosen one end of the wire cloth covering mailing cage, raise it, and follow along with the zinc sleeve until the cage is covered. Escort bees pass thru the perforation, and the rest is easy."—E. J. Ladd, Multnomah County, Ore.

JUST NEWS

Editors

THE crop report committee of the Ontario Beekeepers' Association met in Toronto on July 21 to decide on the prices to be recommended by the association for this year's honey crop. The committee recommends for best quality extracted honey: wholesale, 15c to 18c per pound; retail, 20c to 25c per pound. Comb honey No. 1, wholesale, $2.50 to $3.50 per dozen; No 2, wholesale, $1.75 to $2.50 per dozen. These prices show a reduction of 10c per pound over those of last year.

* * *

The Alabama State Beekeepers' Association will hold its annual meeting at Montgomery, Ala., on Sept. 22. This will be held during the farmers' week, when a large number of farmers and beekeepers will be attending the agricultural meeting.

* * *

Announcement has been made of two short courses in beekeeping in California by the College of Agriculture in co-operation with the United States Department of Agriculture. One of these will be held at some point in southern California during the week beginning Dec. 5, and the other at Berkeley during the following week. Dr. E. F. Phillips and Geo. S. Demuth are scheduled to carry the major portion of the program.

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Colorado is to have two short courses in beekeeping conducted by the College of Agriculture in co-operation with the United States Department of Agriculture. The first of these is to be held at Fort Collins during the week of Nov. 21, and the other at Grand Junction the following week. The instructors scheduled for these two schools are Dr. E. F. Phillips, Geo. S. Demuth, Kennith Hawkins, Wesley Foster, and Frank Rauchfuss.

* * *

On Sept. 28, the A. I. Root Company will hold a field day at one of its apiaries at Bay Minette, Ala., where the company has some 700 colonies of bees. Elizabeth Malden of Auburn, Ala., one of the State extension workers, who is not only for general agriculture but beekeeping, will be present. It is hoped that Prof. H. D. Hughes of Newbern, Ala., and E. R. Root of Medina, Ohio, will be at this meeting. Moving-picture films illustrating various stages of beekeeping and bottling honey will be given on this occasion. While this will be a basket picnic of beekeepers, the A. I. Root Company will serve honey ice cream, honey lemonade, and honey jumbles. Free automobile service from the station at Bay Minette to the A. I. Root Company's apiaries will be furnished.

The rumor which reached this office to the effect that the appropriation for the control of bee diseases in Florida had been reduced, as reported on page 369, June issue, was false. Instead of this the amount set aside for bee disease work at the meeting of the State Plant Board, on July 11, was $10,000, this being exactly twice the amount which was available last year and the year before.

* * *

The South African Bee Journal published at Johannesburg by the South African Association of Beekeepers, now in its first year, is a bright and newsy publication. South African beekeeping is now making great strides, and this section of the world promises to become an important honey producing region.

* * *

The report on bees, honey plants, and honey for the July 1 schedule of the Bureau of Markets and Crop Estimates, of the United States Department of Agriculture, shows the average yield of surplus honey per colony to July 1 for the United States to be 23.7 pounds against 25.5 for 1920, and against a five-year average (1916-20) of 22.4 pounds. This yield to July 1 is estimated to be 48.7 per cent of the total crop. The figures also show that the average condition of colonies compared with normal was 89.8 per cent on July 1 as against 88 for 1920, and 89.2 per cent average for 1916 to 1920. The average condition of the honey plants as compared with normal on July 1 for the United States is given as 78.6 per cent as against 86.2 for 1920 and 84.5 average for years 1916 to 1920.

* * *

Following is an additional list of important fairs offering prizes for beekeeping exhibits, showing the amounts offered this year with comparative figures for 1920. This list is in addition to that published on page 509 August issue.

Fair.	Location.	Date.	1920 Prizes.	1921 Prizes.
Ala. State,	Birmingham,	Oct. 3-8	$125.00	$125.00
Colorado State,	Pueblo,	Sept. 26-30	314.00	!
Ga. State,	Macon,	Oct. 27-Nov. 5	181.50	181.50
Ky. State,	Louisville,	Sept. 11-17	49.00	49.00
Miss. State,	Jackson,	Oct. 17-22	10.00	!
Miss.-Ala.,	Meridian, Miss.,	Oct. 10-15	10.00	19.50
Mont. State,	Helena,	Sept. 12-17		185.00
Mid. Emp.,	Billings, Mont.,	Sept. 19-23	86.00	111.00
N. Y. State,	Syracuse,	Sept. 12-17	394.00	348.00
N. Car. State,	Raleigh,	Oct. 17-22	153.00	123.00
Okla. Free State,	Muskogee,	Oct. 3-8	437.00	462.00
S. Dak. State,	Huron,	Sept. 12-17	144.00	147.00
E. Tenn. Dist.,	Knoxville,	Sep. 26-Oct. 1	*	171.00
Utah State,	Salt Lake City,	Oct. 3-8	89.00	140.00
Vt. State,	White Riv. Jctn.,	Sep. 13-16	37.00	37.00
Wash. State,	Yakima,	Sept. 19-24	250.00	250.00
W. Va. State,	Wheeling,	Sept. 5-10	*	78.00

* No record. ! Premium list not yet received.

TALKS TO BEGINNERS

Geo. S. Demuth

IN most localities bees need but little, if any, attention during September; but now, at the beginning of the month, it will be well for the beginner to see that the affairs of his colonies are being properly shaped for winter. To a great extent, their fate during the winter is determined this month, and it will soon be too late to correct any thing that may be wrong, in time to do any good.

If the colonies are prosperous and continue brood-rearing this month, they should be in good condition for winter; but if they are weak, short of stores, have a poor queen or become queenless so but little brood is reared, they will be in poor condition for winter. No amount of winter care can make a good colony out of one that is weak and composed largely of old bees at the end of September.

Less Number of Bees Than During Midsummer.

The beginner who has not examined his colonies for some time will probably be surprised to note the decreased number of bees at this time. Colonies that were rousing strong in June and July, filling several stories with bees, may become so reduced in numbers that on cool mornings later in this month, they will form a cluster which does not cover the combs of the brood-chamber. The expression, ''strong colonies,'' therefore, conveys a different meaning at different seasons. In June or July a colony is not considered ''strong'' unless it has from 50,000 to 100,000 workers, while a strong colony late in September may have only 20,000 or 30,000 workers.

This reduction in numbers sometimes takes place quite rapidly when the colonies work hard in searching and gathering from fall flowers which yield only meager returns; but it is usually less noticeable either when nectar is more abundant or when there is no nectar available to cause the bees to wear themselves out in almost endless searching.

On the other hand, colonies that were only two-frame nuclei in July, if abundantly supplied with stores, will usually build up, so that at the end of September they are equal in strength to those that were exceedingly strong in July. In this way, if all the colonies are prosperous, there is a tendency for them to become equal in strength at the beginning of winter because of the tendency of both strong and weak colonies to rear about the same amount of brood during August and September.

Colonies that are very weak at this time, covering only a few combs, of course, can not rear enough brood to make a good winter colony; and all such should be united, for it is easier to unite the winter bees in the form of brood in September than to unite the emerged bees in October.

To unite two weak colonies, remove the cover from one of them and cover it with a sheet of newspaper, then lift the other hive off from the bottom and set it on top of the newspaper as a second story. When the hives are arranged in this way the bees of the two colonies will gnaw away the newspaper and unite without fighting. No attention need be paid to the queens unless one is much better than the other, in which case the poorer one should be killed before uniting. About a week after colonies have been united in this way, the combs of brood should all be placed together in one story, and the extra story, together with any empty combs, may then be taken away.

Beginners are often inclined to make too much increase and find at the close of the season that they have many colonies that are not strong enough for winter. When the colonies are prosperous in June and July both bees and beekeeper will sometimes greatly overdo things as to increase —the bees by swarming excessively, and the beekeeper by dividing. Beginners should remember that rapid increase is usually followed by a rapid decrease during the winter. The best way to retrieve such a situation is to reunite the divided colonies now even if, after uniting, there are only one-fourth as many colonies as before. A good colony at this time should occupy not less than seven or eight combs.

How Much Brood Should Good Colonies Have in September.

The amount of brood in the hives at this season will depend upon the age of the queen, the amount of stores in the hive, and the presence or absence of a honey flow. With a good queen, together with a moderate honey flow, there may be the equivalent of four to six combs of brood even in the North during the first half of September. With no honey flow, the same queen would have about the equivalent of two combs well filled with brood, provided the colony has a good supply of honey (not less than 10 or 15 pounds). With only a pound or two of honey in the hive, the same queen would have only a few small patches of brood when nectar is not being brought in from the fields, and under the same conditions a a colony with an old queen would have but little, if any brood.

The amount of brood that is normal during the last month of brood-rearing is probably not far from that which would completely fill two Langstroth frames. To the beginner, remembering the large amount of brood in his hives in June, this may seem to be too little for the safety of the bees; but colonies that have this amount of brood near the close of brood-rearing will have enough young bees to insure good wintering if other conditions are favorable. Brood-rearing usually ceases about the first of October in the northern States, and a few weeks later in most of the southern States, tho in a few southern locations it may be continued until later.

Management for Fall Honey Flow.

Where there is a fall honey flow, the bees may continue to gather during the entire month, but usually in decreasing amounts toward the latter part. A fall honey flow in most cases is a slow honey flow, and the bees may be considered as doing well if they gain but little more than a living during the month, tho in some localities a large part of the surplus honey of the season is stored during September. Even where this is true the beginner who has experienced an early honey flow will, no doubt, be disappointed in the small daily gain at this season, when compared with the rapidity with which honey was stored earlier in the seasons.

Bees Build Comb Reluctantly Late in Season.

As the days become shorter and the nights become cooler the bees are not inclined to build new comb freely, and when empty combs are not available in the super, they crowd the honey into the combs in the brood-chamber, sometimes leaving but little space for the queen to lay. When much honey is stored in the brood-chamber, it is stored above and back of the brood, so that the restricted brood-nest is near the entrance.

While this condition may limit the queen too much in some cases, it is well for the beginner to remember that the amount of brood is naturally dimnished late in September thruout the northern States and that there is less danger to the colony in having too much honey at this time than too little.

If colonies become honey-bound in this way early in the month, it may be advisable to take out one or two combs of honey and insert empty combs or frames of foundation, placing them adjacent to combs having brood in them, so as to give the queen more room; but in many cases the trouble corrects itself by a slowing down or stopping of the honey flow. If not too late the brood will then be increased, some of the honey adjacent to the brood being used, thus giving the queen more room.

Comb Honey Production Late in Season.

On account of the reluctance with which bees build comb late in the season it is not advisable, as a rule, to try to produce comb honey at this time. It is better to harvest the fall crop, if any, as extracted honey; or have it stored in combs in an upper story, to be left on the hive as extra stores for winter or spring; or taken off and stored in a warm room during the winter, to be given back to the colonies in the spring.

It is not advisable to disturb the order of things in the brood-chamber late in the season, for the bees now arrange their stores as they want them for winter. It would not be well, for instance, to insert frames of foundation in the middle of the brood-chamber, to be left there during the winter, even tho they are built out into full combs. Bees prefer old dark combs for their winter nest, and have their own way of arranging affairs for their safety during the winter.

As a rule, a fall honey flow results in the colonies being in good condition for winter, for the late honey flow stimulates brood-rearing, and, altho the older bees are worn out more rapidly, they are replaced by young bees which are better able to survive the winter.

Danger From Shortage of Stores.

Where there is a dearth of nectar during September, there is danger that brood-rearing will be so reduced that there are not enough young bees for good wintering; but here, again, it is usually safe to leave the matter with the bees as to the amount of brood to be reared in September, provided they do not run short of stores. The beginner should be sure that there is enough honey in the hives now, so that the bees will not be forced to stop brood-rearing too early. If any colonies are found having less than the equivalent of three or four full frames of honey, they should either be supplied with a frame or two of honey from an upper story of another colony, if such combs are available, or they should be fed sugar syrup. Colonies, which apparently had an ample supply of honey at the close of the early honey flow in July, may have consumed much of it by the first of September, if there has been none gathered since that time.

If feeding for winter is necessary it can be done this month, tho if any nectar is being gathered from fall flowers it is usually better to wait until early October to do this; for when sugar syrup is fed for winter stores it is well that it be stored after the fall honey flow is over, in order to have it stored where it will be used first, thus leaving the honey for use in brood-rearing next spring.

American Foul Brood.

When brood-combs are handled in examining the colonies for any purpose it is well to acquire the habit of glancing at the sealed brood at this season, to note if the cappings are normal in appearance. In this way, if any American foul brood should be present it can readily be detected by the discolored, sunken, or perforated cappings and the decaying remains of a dead pupa within. On this subject beginners should consult their books and bulletins.

OUR HOMES

A. I. ROOT

Seek ye first the kingdom of God and his righteousness; and all these things shall be added unto you.—MATT. 6:33.

Cast thy bread upon the waters: for thou shalt find it after many days.—ECC. 11:1.

He which converteth a sinner from the error of his way shall save a soul from death, and shall hide a multitude of sins.—JAMES 5:20.

ALMOST 50 years ago, in a union meeting of all the Medina churches I stood up and said something as follows, as nearly as I can recollect:

“My friends, you are probably well aware that I have always been a busy man; and I propose to be a busy man as long as God lets me live. But from this time on, with God's help, I expect to be busy first for the Lord Jesus Christ and for A. I. Root second.

As I sat down Satan suggested: “Why, you can never carry out that program, you *know* you can't. You had better get up and take back at least a part of it.”

But, my dear friends, what a ridiculous thing that would be! There is really no backtrack in such an undertaking. I had just been getting hold of what I have sometimes called my “emergency” prayer—“Lord, help,” and I asked the dear Savior to help me to “hew to the line,” no matter what happened to business or anything else. In fact, as I considered the matter I did not feel really sure I would not have to drop the work of making our land “a land flowing with milk and honey.” Did my new undertaking really conflict with or harm the work with the bees? I leave it to you to answer.

It did not occur to me just then, and, in fact, I do not know that I thought of it until just a few days ago. My decision at that union meeting, to put Christ first and self second, was, in fact, taking God at his word in that precious text that heads this Home paper—“Seek ye first the kingdom of God and his righteousness, and all these things shall be added unto you.”

Well, a short time after the above there was a church conference not far from our town, and I was present. One reason why I dropped business for the day, was because I wanted to know more about the churches of our county and what they were doing. A few miles out of our town there is a little place called Abbeyville. One of the speakers at that conference called attention to Abbeyville as the “sore spot” of our county. A brewery and two or more saloons were running day and night, week days and Sundays, and on Sunday night they had what they called a “Dutch dance.” Abbeyville is only two and a half miles from the old farm where I was born, and I knew something about the place, for I had been there years before, with other boys and drank beer and *on Sunday*.

After the speaker had finished I got up and suggested that the first and best thing to do for Abbeyville was to start a Sunday school there. As I was a newcomer in church work, and but little known at that time, the people turned and stared at me, and I think that some smiled at the idea of a Sunday school in *Abbeyville*. Some good pastor well along in years took my part, and suggested that a committee be appointed by the church, and I was to start that Sunday school, and that was about the start of my putting the Lord's work first from that time on.

The novelty of the Sunday school attracted attention far and wide; and I had the boys and girls singing hymns and repeating texts from the platform until in a few Sundays we had the schoolhouse filled. In fact, some of the toughs of the town who did not feel like coming inside, stood around on the outside near the open windows and listened to what was going on inside.*

My good friends, there are thousands of places right now in our land where people will crowd into the Sunday schools if those schools are rightly managed. But *Satan* got wind of what was going on, and came around as he usually does. The brewer found out that it was hurting his business. One Sunday morning I found a roomful of girls and women, but scarcely a man or boy was present. In reply to my questioning I was told that the brewer had given out that during the hour of Sunday school there would be "free beer" to anybody who wanted it. That incident calls to mind that some of the tactics that are going on now ("beer as medicine," etc.) are much like my experience away back there. What did I do? I said first, "Lord, help." Then I cut the exercises down half, and told the girls and women that we would adjourn to the brewery. Sure enough, there were my boys and men filling the room; but when they caught sight of me they rushed out at the back door and hid in the bushes. I finally succeeded with pleasant words in getting them to come back, and sing some Gospel Hymns. Then I gave them, as well as the brewer, a good square talk—of course in a kindly spirit. When permission was given me to close with prayer I prayed for the brewer, but you my be sure that I did *not* pray for his occupation.

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* I think I ought to mention here that one feature of that Sunday school that drew the crowd was the Scripture texts that were repeated by the well-dressed juveniles. Every one who would stand up on the platform and repeat any Bible text received a picture card; and when they had a sufficient number of these picture cards containing Bible texts they received a pretty little book also published by the American Sunday School Union. As any text, no matter how short, answered, on one particular Sunday a dozen or more little ones stood up on the platform and repeated the words, “God is love.” To cap the climax, one wee girl with lisping tongue stood up and sang a little hymn, the first verse of which is as follows:

“I am Jesus' little lamb;
Happy all the day I am.
I am his and he is mine;
Oh, I'm His lamb!”

Now, even if this is making a rather long footnote, I think I shall have to add that this little girl of toward 50 years ago is now the mother of two stalwart men; and both of them give promise of being a blessing in the line of chemistry and electricity, not only to our State but perhaps to our nation.

Well, friends, the Sunday school prevailed until there was not a brewery, a saloon, nor a Dutch dance in the town, and never has been since. But it took *eight years* of hard work to head off intemperance in that neighborhood. Of course there were no automobiles at that time, and when the weather was too bad for our liverymen to let a rig go out I went on foot five miles and back again; but I firmly believe that some of the happiest hours of my life were when I was trudging thru mud and snow to that Abbeyville Sunday school. I decided then, and I stick to that position even yet, that the only sure remedy for intemperance that still afflicts the world is to bring up our children in the fear of the Lord, with the help of the Sunday schools, the Endeavor Society, Y. M. C. A., Salvation Army, and other things of that sort.

All along these years since that Sunday school was started and kept up I have found some new things to thank God for. (See our second text.) The seeds that were sown in the hearts of the children during those Sunday afternoons have borne fruit abundantly. Let me give you one little illustration. Of course I had discouragements. There were no automobiles in those days, of course, and I had no horse and buggy of my own. A good deal of the time I hired a livery; but as the fall rains came on it was somewhat of a question as to whether the Sunday school would be kept up all winter. I told the children and others that when the weather became very bad, and *nobody* came, I would be the last one to be on the ground. When I reached the schoolhouse during bad weather and found not a single boy or girl, nor anybody else, I would consider giving it up. But I was determined to be the last one on the ground.

One Sunday afternoon when it rained unceasingly, and the mud on our clay roads here in this county was just awful, I called at the livery for the horse and buggy just as I had been in the habit of doing. The liveryman said he preferred not to have his rigs taken out during such weather. I had, however, reason to suspect that he, like the brewer, was not very much in sympathy with Sunday school work. I got some rubber boots and an umbrella and made the trip. By the way, in order to shorten the course a little when going on foot I passed thru a piece of woods. About the center of that woods was a large oak tree, and I was in the habit of kneeling away off there alone in the woods, and asking the dear Lord to bless that Sunday school, and, in fact, take my poor self into His care and keeping on week days as well as Sundays. Oh, how I did enjoy those brief stops for prayer! and what wonderful answers came along for days, weeks, and months after!

When I reached the schoolhouse on that particular day there were only two small barefooted boys there. Not at all disheartened I sat down and had a good talk with them. They told me their troubles. Their poor overworked mother was trying to care for her little family while the poor father gave the most of his scanty earnings to the brewer or to the two saloons as I called them. Before we closed our talk it was my privilege to have them both give me their promise to follow the Lord Jesus Christ. Now for the outcome.

Not many days after, one of those two boys came up to our factory. At that time our first brick building—the one with the beehive and the motto cut in front, "In God We Trust"—was just finished. The motto was made from a block of sandstone, and probably will last long after A. I. Root has gone to his reward. Well, this boy asked if I could not give him some work to help relieve his poor mother. I said, "Why, my good boy, while I admire your spirit, I am afraid you are too young and small to do any work." He replied:

"Mr. Root, I know I am small, but I will do a good job of trying if you will just give me a chance."

I told him to come with me, and I went clear thru the busy rooms but did not see any place for him until I got down into the engineer's room. The engineer was busy shoveling coal under the boiler. I asked him if he thought he could find something for the boy whom I held by the hand. He took a look at the boy and said, "Why, I think I can, perhaps. Just let him stay here and we will see."

I was so busy, about that time in my life that, to tell the truth, I really forgot about the boy. It might have been two or three days after when I came around and said, "Oh! by the way, Park, how about the boy?"

It was one of my happy surprises when he replied, "Why, Mr. Root, he is one of the brightest and handiest boys I ever ran across. He is equal to a man for a good many things."

On a later trip the report was still more favorable.

"Mr. Root," said the engineer, "that boy knows everything about the engine almost as well as I do. When I want to be away for a little while he can run the whole institution, and keep things in splendid shape.''

Let me tell you right here that that boy's name was Jacob. He not only proved to be a worker, but he made friends right and left. I might almost say that he made it his study day and night to become fully posted in regard to every detail of the A. I. Root institution.

At that time we were about half a mile from the postoffice and the bank. Our office was mainly in charge of girls and women. Let me say right here that I discovered years ago that girls and women can do almost everything that men do, and many things such as office work they can and do do even *better* than the average man or boy. The great wide world is just now finding out what I demonstrated away back. We had some very bright women in our office. I have told you something about the one we called ''Queen Bess.'' The women in the office told me they wanted an errand boy to carry the mails and go to the bank—one who was quick and bright, and who could be *depended* on; and I do not know but they had their eyes on Jacob already. Perhaps Jacob, then getting to be quite a strapping youth, had had his eye on the office, and maybe he also got a glimpse of the way ''rush orders'' were pushed by some of the nice women in the office. He took the job of being errand boy to the bank and postoffice, he soon grasped every detail, and he was not afraid to push right and left in order that the business with the mails and bank might be rushed with alacrity. Jacob and his brother are still occupying important positions in different departments of the A. I. Root Co.

There is just one more thing I almost forgot to tell. Years ago Jacob was married to one of the bright girls in the office, and now has a family and a home of his own. Just a few days ago they were all shaking hands with Jacob when I inquired the reason. Some of the crowd, laughingly, informed me that Jacob had just received news that he was grandfather; and I think the father of the newcomer, if I am correctly informed, is or was a high school professor.

By the way, the above is substantially the talk I gave in John Wanamaker's Sunday school in Philadelphia; and when I closed my talk, with the words of my favorite hymn, ''From sinking sand He lifted me,'' there was a fluttering of handkerchiefs in that great audience of between two and three thousand.

The boy Jacob after he got to be errand boy for the nice women clerks in the office. Jacob was one of my first converts—possibly the very first. Take a good look at the boy's face and then see our second text. When he used to carry the mail from the postoffice to the factory, sometimes there were several bundles, and then he had to use the things tied to his waist in order to carry them.

HIGH - PRESSURE GARDENING

A Fruit and Truck Farm of 3,500 Acres.

Some time last winter a relative sent me a little periodical that told a story as follows:

Years ago a New Jersey farmer drove up in front of a country store and said to the merchant something like this:

''Mr. Blank, I have brought you a couple of dozen heads of nice lettuce. I wonder if you could sell them.''

The storekeeper said he thought he could. A small boy who sat beside his father in that one-horse wagon was a good deal interested in the transaction, and considerably more so when the merchant soon sent word that he wanted all the lettuce like the two dozen heads that the farmer could furnish.

Well, the reporter who told the above story made a call on that same boy after he had grown up to manhood, and had become manager of the celebrated Seabrook truck farm. While they were talking a telegram came to Mr. Seabrook reading somewhat as follows:

"We want two *carloads* of lettuce such as you have been selling us, delivered here tomorrow night in New York City. Can you make it?"

The reply was "All right. You can have your lettuce."

When I read the above I said to myself, "I am going to see that great truck farm, Providence permitting."

Just one thing more: The article went on to state that from the time that boy went with his father to the country store he began experimenting along the lines of "*high-pressure* gardening." As he grew in experience he began using fertilizers at a rate before unheard of. For several years he worked in company with his father; but his father actually got scared at the amount he was paying for manure and other fertilizers for just one acre of ground.

Now, friends, as Mr. Selser was with me on my travels in New Jersey, and especially in Philadelphia, and on account of my defective hearing, I will let him tell things in his own words as to where we went and what we saw.

On July 8 we visited a number of the bogs containing 600 acres in all of cranberries, which were out in bloom and fruit. The berries grow on little single shoots, hardly big enough to be called a bush (about 3 to 5 inches high). They are subject to a number of insect pests, which are overcome by flooding the bogs two or three times during the season, as can be easily done from the adjacent dams. There is, however, a blight or fungus which attacks the fruit. The State has now an immense $5,000 high-power sprayer, which produces 1,000 pounds pressure to the square inch. This was operating at 600 pounds pressure and throwing the spray, which looked like a fine snow, about 300 feet. Mr. Chambers, a son-in-law of Mr. White, was assisting the State authorities in operating the sprayer. The hose, 1¼ inches and very heavy, has to be taken apart in sections and carried thru the bog by two or three men.

We then returned to Mr. Hornor's by way of Camp Dix, where several hundred West Point cadets were in camp. We saw only a couple of them. These buildings, which during the war were occupied by some hundred thousand men, are of frame structure but not in very good condition. The Government has recently purchased this ground and expects to establish a permanent camp at this place.

At Finley, N. J., near Bridgeton, on July 8, we visited the Charles F. Seabrook cucumber plantation. We met the manager, Charles F. Seabrook, and W. W. Oley, general manager of the New Jersey State Experiment Station. We were conducted by auto thru the extensive orchards and vegetable fields. The farm has 2,000 acres devoted to fruit culture and 1,500 acres devoted to berries, vegetables, etc. They have a nursery and grow their own trees. When they buy them, they send Mr. Oley into all parts of the United States to select all their requirements. Among the young one and two year-old apple trees they are growing a succession of bush lima beans. At the present time they have 800 acres in beans. They are just erecting a vinery—a large building in the center of the bean district containing six new, improved machines for shelling and cleaning the lima beans. The vinery will start operating soon, and the beans are so planted that these machines will be in continuous operation from now until fall. They put these beans up in cans.

We were then conducted to their cucumber houses, six in all, where they are now shipping cucumbers to the value of $300 a day. At the present time they are getting $1.25 a dozen. They have shipped this season $4,000 worth of cucumbers. Mr. Seabrook's uncle conducted us thru this establishment and showed us bees in specially constructed hives at each opposite end of each greenhouse with an entrance both in the greenhouse and on the outside. They arranged the greenhouse by taking away some panes of glass adjoining the inside entrance for the bees. The top row of glass on the entire greenhouse is always left open so that no bees are lost by getting out and going to the wrong hive. Mr. Seabrook claimed that this removing of glass adjoining the hive was the latest method, which absolutely insured the success of the bees returning to each hive, where prior to that hundreds were lost in the greenhouses. This day they were taking off the supers which were filled with honey. I told them of one fruit-grower in New Jersey who had offered $500 for the rental of 100 colonies of bees among his orchards for three weeks next year. He felt that this was very important, and said that another season he was going to see that they had a big quantity of bees well distributed, and would increase them from year to year as the trees grew to fruit-bearing.

We then visited the ice plant and cold storage warehouses connected with a pre-cooling plant where they were shipping out cabbage, after it was pre-cooled, which insures perfect delivery no matter how hot the weather is. They were turning out 20 tons of ice that day. Adjacent to the cold storage and ice plant were 200 acres of berries and vegetables under irrigation. They were then harvesting large fields of onions, and were shipping two to three carloads of onions every day. It was a beautiful sight to see the Italians cleaning the onions and packing them in hampers for shipping. After the cucumbers are taken out, lettuce is planted, followed by radishes. They ship 17 carloads of lettuce out each day to various markets.

The perfect irrigation thru the pipe system was a wonder to Mr. Root. Mr. Root was simply amazed, and enjoyed every minute at this wonderful plantation. Mr. Oley was exceedingly solicitous that Mr. Root should have a full explanation of every part of this plantation that he wished.

On July 9 we visited the Foster Exhibition Pavilion where Airline is to have an exhibit in their north window on the board walk for two weeks over Labor Day, beginning Aug. 27. The lady secretary was very anxious to meet Mr. Root, and expressed her opinion that it was a marvelous thing that he should be the head of such a successful corporation and continue to be so active up to the age of 82 years.

We took a wheel chair and had an hour and a half's ride up the board walk to the inlet. We saw the thousands of bathers on the beach and the aeroplane boats taking passengers at intervals along the ocean front. On returning to our starting point and paying for our hour and a half's ride at the rate of 75 cents an hour, the pusher claimed we owed him 25 cents each an hour for his work. We inquired of the officer and the proprietor, both of whom evaded the subject, showing that there was a general concerted action on the part of the pushers of these wheel chairs to fleece the public. However, the proprietor was forced to acknowledge that the rate he charged included the pusher; and on further investigation he stated he paid the pusher 40 cents for pushing the chair during the time we occupied it. Therefore, we refused to pay him anything additional, for which we received somewhat of a blackguarding by the pusher himself. We felt like informing the mayor of the city that their officers were in league with this imposition, but concluded our time would not permit. We returned to Philadelphia on the two o'clock train, going direct to Jenkintown, and in the evening visited Willow Grove Trolley Park. This wonderful place is well policed and visited every day by seventy to a hundred thousand people. We listened to the evening concert by Victor Hubert's orchestra (getting a front seat) in which Mr. Root was intensely interested. Benches surrounded the auditorium and were scattered for *acres* in every direction, seating many thousands of people.

After seeing the many amusements in the various parts of this park, we visited Venice, in boats, traveling for 10 minutes thru canals and streets representing the various parts of this wonderful city. From there we went to the lake, where the electrical current effectively played, electric fountains showing marvelous colors and formations in the water.

On Sunday, July 10, after breakfast we visited the golf courts and club adjoining Mr. Selser's home, comprising 128 acres, left in trust to the Friends Society 200 years ago by a descendant of William Penn for the benefit and education of the Friends' children. Mr. Root was amazed at the vastness of the grounds, with the short-cut lawn, greens, and tees of the club.

At one o'clock we visited John Wanamaker's Sunday school, having secured an up-to-date electric automobile (costing about $5,000), driven by a licensed chauffeur. Mr. Root enjoyed every part of this trip from Jenkintown to 22 Bainbridge, where the church is located, a distance of about 14 miles. Mr. Root was ushered to the platform and took a seat by the side of Mr. Coyle, the acting superintendent, and John Wanamaker, the real head superintendent. Mr. Wanamaker was delighted to meet Mr. Root, and before Mr. Wanamaker reviewed the lesson from the desk he called on Mr. Root, after introducing him as the head of the bee industry of the United States, and the founder and lover of Sunday schools. Mr. Root spoke for about five minutes very effectively and forcefully on his experience in the founding of a Sunday school in a community dominated by the brewers' interest where everybody predicted no Sunday school would succeed. (Mr. Coyle turned to me and said, "What a wonderfully clear voice for a man of his age, and how well he is making everybody hear all he says.) After explaining how he had gathered the Sunday school together, thru visiting the mothers as well as the children, and had established a large school, which finally drove out the brewers' interest, he closed with the beautiful words of the hymn, "From sinking sand He lifted me." Mr. Wanamaker was very visibly affected. He extended his hand when Mr. Root sat down, with most cordial and hearty praise and thanksgiving for his speech. A Mrs. Miller was called on to sing, with the most wonderful voice we ever heard, with a plea in the song "to open the doors of our hearts to the sunlight and open the doors of our hearts to the smile."

Mr. Wanamaker then followed for 15 minutes with an exposition of the lesson on "The death and stoning of Stephen." He mentioned a striking coincidence that, that very morning, he had spoken on the subject of bees and their hives without any knowledge that Mr. Root was going to be present in the afternoon, and expressed the thought that somehow there was an underlying influence in bringing this about, and so appreciated Mr. Root's address. He said that today he had been superintendent of the school just 63 years, 4 months and 20 days, and he hoped God would spare him to live 63 years more, his age now being 83, and he was glad to be able to hear Mr. Root at his age tell how he loved the Sunday school. He spoke of the death of Stephen, and said Stephen didn't see the stones coming at him, or anything surrounding him; but he looked up and saw Jesus. Mr. Wanamaker asked, "What is death in the world, if *we* are looking up to Jesus?"

Mr. Wanamaker pointed to the side platform, showing a beautiful oil painting that was his birthday present, the subject being the old Farm House at Selgra in England, showing George Washington's old ancestral home. He said the Bible was a wonderful guidebook to another world, and it was well for us to study this guidebook. He closed with an illustration of the dying soldier, who was asked if he was a church member, and he said "Yes"; and the second question to the dying man was, "Under what persuasion?" and the dying man's reply was from the Apostle Paul: "I am persuaded that neither life nor death nor principalities, nor things present nor things to come * * * shall separate us from the love of God which is in Christ Jesus our Lord." A wonderfully big male chorus sang very effectively "Stealing away to Jesus," in which Mr. Root gave a hearty and audible amen, and Mr. Wanamaker almost clapped his hands in appreciation of Mr. Root's expression.

The three galleries and class-room were arranged in a circular form, holding 3,000 people. Mr. Root was amazed and said it was the most wonderful building and school he was ever in. Mr. Wanamaker presented Mr. Root with two fans. Attached to each side of the fans was an order of exercises for the summer months at Bethany Sunday school, with a number of beautiful hymns they sing.

We returned home in the electric automobile thru the western part of the city, Fairmount Park and Wissahickno Drive. W. A. Selser.

Jenkintown, Pa., July 11, 1921.

In regard to the cranberries mentioned above, it seems that Miss White and her people had been experts in the cranberry business before she started her experiments with blueberries. The reference to Camp Dix gave me a glimpse of the awful *price* the great World War cost the United States, to say nothing of other nations. I think the camp is something like two miles long and a mile and a half wide, pretty well covered with cheap plain buildings. Most of them are now, however, in bad repair. Windows were broken out, and everything was going to ruin. Oh, what a contrast between high-pressure *gardening* and high-pressure *murder*, if I may use the term!

Now, I can not begin to tell all I saw on that great Seabrook farm. As an indication, however, of the careful way in which Mr. Seabrook manages, let me mention one little item.

In purchasing fruit trees, no matter where you get them, there is more or less liability that when they come to bearing they will not be true to name; and so the manager, Mr. Oley, explained that he went to bearing trees and procured from them such buds as he wanted. He took these to Storrs & Harrison, the celebrated nurserymen, and asked them to insert them in their best trees of the right age, and when they were fully started they were to ship him the trees. In this way they have thousands of fruit trees that bear or will bear just such fruit as experience has indicated is best for their location; and everything else on that great farm is done in just that way. Railways are everywhere to pick up the crop, and beautiful graded and improved roads facilitate the gathering of such a crop. They are practically independent of rain on the 200 acres that are under overhead irrigation. They have their own ponds and lakes to supply water. They manufacture their own ice for the refrigerator cars or for "pre-cooling." They have a large trade in canned lima beans. These beans are shelled before canning; and I was greatly surprised when they told me that six great machines were built on purpose to shell *green* lima beans before putting them into cans. Of course they have their own canners.

This whole institution shows how great enterprises are managed much as manufacturing is. Steam and electric power and the best up-to-date machinery in the whole wide world contribute to do things by power where before it was done by hand; and it is possible because of the magnitude of the tremendous crops that are produced, and by the up-to-date methods, and by doing it on a large scale, instead of a *little* of "this, that, and the other."

The item in regard to tipping indicates the way in which friend Selser with his large circle of acquaintances in a great city is able to rebuke and reprove graft. I have before told you that in Tennessee they have a law against "tipping" on Pullman cars. Now, I object to what is called tipping; but at the same time when a porter or anybody else puts himself out of the way to give me a helping hand I am willing to reward him reasonably. But I do not believe in giving half a dollar nor even 25 cents for every little service rendered. Mr. Calvert once offered a porter ten cents for some little service. The porter handed it back, indicating by his action that he was not in the habit of getting less than a quarter of a dollar or a half. I mentioned this to Mr. Selser, who said that he himself often gives a dime or even a nickel. In one case he mentioned the fact that he offered a nickel to a boy in a big hotel for some trifling service. The boy threw the nickel on the ground. Mr. Selser reported the transaction to the man at the desk. The boy was called up and dismissed on the spot. The proprietor of the hotel said something like this:

"Young man, I give you to understand that the guests of this hotel are not be insulted by even a small boy like yourself."

I was curious about the wheel chairs used there. A bronze plate was very conspicuous on the front of every vehicle, reading, "75 cents an hour for two passengers; $1.00 for three passengers." Nothing was said about a man to push the chair. But our "pusher" took the ground that the price was for the wheel standing still. I suppose that in that great thorofare in Atlantic City most people submit to the graft rather than to complain or make a fuss.

The Hubam Clover, by Professor Hughes Himself. Also a Kind Word for Our Home Department.

On page 445 of our July issue I suggested that Prof. Hughes might have noticed my experiments in trying to find a superior strain of the biennial sweet clover, these experiments having been made some years ago. From the following letter, however, it seems quite plain that our good friend Hughes knew little or nothing of my work along that line.

Dear Mr. Root:

I have not had ready access to Gleanings in Bee Culture, but occasionally have seen a copy; and one afternoon last spring went to the chemistry building of the Iowa State College, where the bee journals are housed, to acquaint myself with your journal. I had thought to be there for a few minutes; but before I knew it, it was half-past five and the librarian closing, so I secured permission to take Gleanings home with me. I told Mrs. Hughes that it was the most pleasant half day I had spent, and the following Sunday I read selections from your department to the whole family—to the enjoyment of all. And the selections had nothing to do with Hubam clover either—but concerned the things most worth while in life. I am told that during a great banquet once being held in London in honor of the man who discovered chloroform he was asked which of his discoveries he thought most important. His reply was, "The most important discovery I have made was the fact that I was a sinner and needed Jesus Christ as my Savior." I assure you that I would very much appreciate receiving your journal regularly.

With regard to Hubam living thru the winter and seeding again the following spring, we have many reports that this is the case. From Washington, Oregon, and California where the plants have made a growth of from five to nine—and even eleven—feet with a heavy crop of seed, we have reports that they have come again the following year and repeated the performance. We have also had similar reports from Maryland and Virginia and one from Illinois. In these cases nearly every plant produced a crop of seed both the first and second years; but from all sections of the country plants have produced crops the first year and lived thru the winter. I am inclined to believe that in a good many cases these plants did not produce seed the first year, but were either biennials or hybrids. A number of these hybrid plants have been, and are, under observation at Ames where they have not proved to be hardy plants, every one of them winterkilling, tho some of them have made a wonderful growth.

Last fall we took 20 or 30 into the greenhouse and produced during the winter self-fertilized seed, which have been planted in the fields this spring. We have also made a very large selection of seed from individual plants; of these about 170 were planted in the greenhouse last fall from which self-fertilized seed were produced. The open fertilized seed secured last fall together with the self-fertilized seed have all been planted in the fields at Ames this spring.

Very truly yours,
H. D. Hughes.

Newbern, Ala., June 21, 1921.

HUCKLEBERRIES FOR BEES, AND BEES FOR HUCKLEBERRIES.

After the article on pages 514-516 was all set up, Miss White writes in regard to the opening paragraph of said article as follows:

"Dr. Frederick V. Coville, U. S. Department of Agriculture, discovered the need of acidity, and Miss E. C. White located the wild bushes."

She also adds as below:

My dear Mr. Root:

Blueberries are nearly or quite sterile to their own pollen, and it is necessary to plant two varieties in close proximity and to have bees to do the pollinating. The tubes of the blueberry flowers are just about as long as Italian bees can negotiate. Wild bumblebees and little wild bees that can creep into the flower tubes do the work more easily. The honeybees, nevertheless, are constantly found at work on the blueberries, and I consider their presence near the blueberry fields of great importance.

I appreciate greatly your interest in our blueberry development and the help of the publicity you are giving it. With many thanks.

Sincerely yours,
Elizabeth C. White.

New Lisbon, N. J., July 18, 1921.

Blueberries in Florida.

On pages 515 and 516, last issue, I mentioned blueberries in Florida. On the latter page Mr. Sapp's name was mentioned. Below is something I have just received from that nurseryman:

Mr. Root:—

I have no catalog of my blueberry orchard, as I contracted all my plants to the Carmen Grape Co., Oldsmar, Fla. I have about ten acres in blueberries. They do well in this part of Florida. They are free from disease and insect pests, and average from 25 to 40 quarts to the bush. From old trees I have sold several hundred quarts this year. They last from the middle of May to the middle of August.

M. A. Sapp.

Crestview, Fla., Aug. 4, 1921.

Classified Advertisements

Notices will be inserted in these classified columns for 30c per line. Advertisements intended for this department cannot be less than two lines, and you must say you want your advertisement in the classified column or we will not be responsible for errors. Copy should be received by 15th of preceding month to insure insertion.

REGULAR ADVERTISEMENTS DISCONTINUED IN GOOD STANDING.

(Temporary advertisers and advertisers of small lots, when discontinued, are not here listed. It is only regular advertisers of regular lines who are here listed when their advertisements are discontinued when they are in good standing.)

John G. Miller, E. E. Mott, J. D. Beals, A. S. Tedman, Jes Dalton, H. N. Boley, J. B. Notestein, Prof. W. A. Matheny, H. G. Quirin, Jul Buegeler, G. H. Merrill, M. F. Perry, Arlie Pritchard, Mathews Engineering Co., Frank Bornhoffer, Norman Brothers' Apiaries, Ohio Valley Bee Co., M. C. Berry & Co., Cavies Distributing Co.

HONEY AND WAX FOR SALE.

FOR SALE—Fancy clover honey in 60-lb. cans. Jos. Hanke, Port Washington, Wis.

FOR SALE—Choice white clover honey in 60-lb. cans—none finer. J. F. Moore, Tiffin, Ohio.

FOR SALE—Choice white sweet clover honey in two sixties, $14.00. The Stover Apiaries, Mayhew, Miss.

FOR SALE—Fine quality raspberry milkweed honey in 5-lb. and 10-lb. pails and 60-lb. cans. P. W. Sowinski, Bellaire, Mich.

FOR SALE—A ton of extracted honey suitable for baking purposes. E. D. Townsend & Sons, Northstar, Michigan.

FOR SALE—Finest clover and basswood honey in 60-lb. cans. Sample 15c. Write for prices. A. S. Tedman, Weston, Mich.

FOR SALE—8000 lbs. choice white clover extracted honey. Sample 20c, applied on first order. C. H. Hodgkin, Rochester, Ohio.

FOR SALE—Several thousand pounds of the finest quality clover extracted honey. New cans and cases. None better produced. Howard Townsend, Northstar, Michigan.

FOR SALE—Extra choice extracted white clover honey, put up in new 60-lb. cans and 5-lb. pails. Sample 20c, same to apply on first order. David Running, Filion, Mich.

FOR SALE—Clover, basswood, or buckwheat honey, comb and extracted, by the case, ton, or carload. Let me supply your wants with this fine N. Y. State honey. C. B. Howard, Geneva, N. Y.

FOR SALE—White clover honey, almost water white. Put up in new 60-lb. tin cans, two to the case. Write for prices. D. R. Townsend, Northstar, Mich.

FOR SALE—Our crop of 60,000 lbs. finest quality comb and extracted honey. Also 4000 lbs. of last year's extracted honey at reduced prices. Gelser Bros., Dalton, N. Y.

FOR SALE—White honey, 15c a lb.; L. A. alfalfa, 14c, in two 60-lb. cans; Chilian in 165-lb. kegs, 10c; light amber honey in 50-gal. bbls., 80c a gal. Beeswax, 30c a lb. Walter C. Morris, 105 Hudson St., New York City.

CHOICE clover honey in new 60-lb. cans, all produced on new combs. Sample 20c. W. B. Crane, McComb, Ohio.

FOR SALE—Extracted clover and basswood honey, 60-lb. tins; also fine grade buckwheat in pails and 60-lb. tins. Leroy Lloyd, Caywood, N. Y.

FOR SALE—A-1 diamond-clear white sweet clover honey, in new 60-lb. cans, two cans to the case, 10c a pound, f. o. b. Moville, Iowa. Virgil Weaver.

FOR SALE—Clover-basswood honey in new 60-lb. cans, also buckwheat extracted in cans and kegs. Write for price. E. L. Lane, Trumansburg, N. Y.

FOR SALE—12,000 lbs. of choice white clover honey in 60-lb. cans at 15c per lb., f. o. b. Brooksville, Ky. Sample 25c. W. B. Wallin, Brooksville, Ky.

FOR SALE—White honey in 60-lb. cans, also West Indian in 50-gal. barrels. Sample and price on request. A. I. Root Co., 23 Leonard St., New York City.

FOR SALE—Finest white clover extracted honey. One 60-lb. can, $9.60; two 60-lb. cans, $18.00, f. o. b. Holgate, Ohio. 5-lb. pail, $1.25; 10-lb. pail, $2.25; delivered to 4th postal zone. Noah Bordner, Holgate, Ohio.

EXTRA fine white sweet clover honey, new crop, in 5-gal. cans, case of two cans, $15.00; one can, $8.00. Write for prices on a ton or a carload. Sample 10c. C. S. Engle, 200 Center St., Sioux City, Iowa.

EXTRA fancy well-ripened clover honey in new 60-lb. tins, two cans to the case, $16.00 per case. Write for prices on large quantities. Sample 20c to be applied on first order. Edw. A. Winkler, Joliet, R. D. No. 1, Ills.

HONEY FOR SALE—In 60-lb. tins, water-white orange, 14c; water-white sweet clover, 12c; extra L. A. sage, 11c; N. Y. State buckwheat, 10c, for immediate shipment from New York. Hoffman & Hauck, Inc., Woodhaven, N. Y.

FOR SALE—New crop finest quality white clover and basswood extracted honey in new 60-lb. tin cans, two cans in case at $13.00 per case, f. o. b. Sample, 10c. Daniel Johnson, Cazenovia, R. D. No. 2, New York.

FOR SALE—Extra fine Michigan white clover and basswood honey. Almost water white. Indeed, I doubt if the color, body, and flavor can be beat. Put up in 60-lb. cans, two to the case, at 15c per pound, or in 5-lb. pails, 50 to the barrel, at 17c per pound. Sample 15c. O. H. Schmidt, R. D. No. 5, Bay City, Mich.

I HAVE about 30,000 lbs. of choice sweet clover honey and to get some cash hurriedly I will sell it at 10c per pound f. o. b. Don't think anything wrong because it is cheap, for it is clear and all sealed on hives before extracting, and put up in second-hand cans that are as good as new on inside. Try it. Joe C. Weaver, Cochrane, Ala.

FOR SALE—New crop choice clover extracted honey packed in NEW cans and cases at wholesale price of $14.85 per case of two 60-lb. cans and $14.40 per case on orders of five cases or more. I will have only a half crop. A few cases of last year's clover honey at 10c. No. 1 comb honey, $48 per carrier of 8 cases. No better honey is produced than mine. Sample 20c. J. D. Beals, Oto, Iowa.

RASPBERRY HONEY, blended with willow-herb honey, two of the best honeys produced in northern Michigan. It was left on the hives until thoroly ripened by the bees. It is thick, rich, and of the finest flavor—none finer for table use. It is put up in 60-lb. cans. Price, two cans in a case, $18.00; one can in a case, $9.50. Sample by mail, 20c, which may be applied on purchase of honey. Elmer Hutchinson & Son, Lake City, Mich.

FOR SALE—Clover, basswood, or buckwheat honey, in 5-lb. or 10-lb. pails, or 60-lb. cans. H. B. Gable, Romulus, N. Y.

FOR SALE—Extra fine clover honey in new 60-lb. cans, two to the case, at $15.00; also in 30-lb. cans at $3.75 for one can. Martin Carsmoe, Ruthven, Iowa.

YOU only have to buy 600 pounds of E. D. Townsend & Sons' fine clover extracted honey to get their very lowest wholesale price this year. If your customers require the best, write them at Northstar, Michigan, for their price.

FOR SALE—No. 1 white comb honey, $6.00 per case; No. 2 white comb, $5.00 per case of 24 sections, six cases to carrier. Clover extracted, two 60-lb. cans to case, 15c a lb.; clover in five-lb. pails, $1.00 each, 12 pails to case. Amber baking honey in 60-lb. cans, 10c; same in 50-gal. barrels, 8c. H. G. Quirin, Bellevue, Ohio.

FOR SALE—A carload of the very finest quality extracted honey. This crop of honey was produced above excluders, in white combs that have never been used for brood; then the entire crop was left upon the hives until some time after the close of the honey flow, so is very thoroly cured by the bees. It is being put into new 60-lb. net tin cans, in fact, not a single thing has been neglected to make this crop of honey the finest possible to produce. It was gathered from white clover principally, with a very little basswood mixed in it, perhaps 5%. Of course, this fine honey is worth more than ordinary honey and we have to ask just a little above market price for it, so those not having a market that will pay a little more for an extra quality honey, had better not write about this year's crop of honey. The crop will be ready for the market some time this month, August. E. D. Townsend & Sons, Northstar, Michigan.

HONEY AND WAX WANTED.

HONEY WANTED—Give particulars in first letter. Elton Warner, "Beaverdam," Asheville, N. C.

WANTED—Honey, section, bulk comb, and extracted. W. A. Hunter, Terre Haute, Ind.

HONEY wanted, send sample, state lowest price. E. A. Harris, Albany, Ala.

BEESWAX WANTED—For manufacture into SUPERIOR FOUNDATION. (Weed Process.)
Superior Honey Co., Ogden, Utah.

WANTED—Comb and extracted honey. State price. Send sample of extracted with first letter. A. W. Yates, 3 Chapman St., Hartford, Conn.

WANTED—Beeswax, also old comb and cappings to render on shares. Will buy your share and pay the highest market price. F. J. Rettig, Wabash, Ind.

WANTED—All kinds comb and extracted honey and beeswax. Car lots or less—and full colonies of bees. W. C. Morris, 170 Rossiter Ave., Yonkers, N. Y.

WANTED—Beeswax. We are paying 1 and 2c extra for choice yellow beeswax, and in exchange for supplies we can offer a still better price. Be sure your shipment bears your name and address, so we can identify it immediately upon arrival, and make prompt remittance. The A. I. Root Co., Medina, Ohio.

WE BUY honey and beeswax. Give us your best price delivered in New York. On comb honey, state quantity, quality, size, and weight of sections and number of sections to a case. Extracted honey, quantity, quality, how packed, and send samples. Charles Israel Bros. Co., 486-490 Canal St., New York City.

WANTED—Extracted clover honey (new crop). State how packed. Send sample and name lowest price f. o. b. Brooksville, Ky. H. C. Lee.

WANTED—Shipments of old combs and cappings for rendering. We pay the highest cash and trade prices, charging but 5c a pound for wax rendered. The Fred W. Muth Co., Pearl and Walnut Sts., Cincinnati, O.

OLD COMBS WANTED—Our steam wax-presses will get every ounce of beeswax out of old combs, cappings, or slumgum. Send for our terms and our new 1921 catalog. We will buy your share of the wax for cash or will work it into foundation for you. Dadant & Sons, Hamilton, Illinois.

WANTS AND EXCHANGES.

WANTED—First editions of the writings of noted books on bees. Apply to Mrs. Fox, Foxden, Peekskill, N. Y.

WANTED—Honey in exchange for Cleveland suburban 40x120 lot worth $400. G. Tutthill, Marine Bldg., Chicago, Ill.

WANTED—Old combs and cappings for rendering on shares. Our steam equipment secures all the wax. Superior Honey Co., Ogden, Utah.

WANTED—To trade good tested queens of the Moore strain for a good rabbit dog. Beagle hound preferred. Elmer Hutchinson & Son, Lake City, Mich.

BEESWAX wanted. Old combs (dry) and cappings for rendering. Also wax accepted in trade. Top market prices offered. A. I. Root Co. of Iowa, Council Bluffs, Iowa.

FOR SALE.

HONEY LABELS—New designs. Catalog free. Eastern Label Co., Clintonville, Conn.

FOR SALE—A full line of Root's goods at Root's prices. A. L. Healy, Mayaguez, Porto Rico.

ROOT'S BEE SUPPLIES—For the Central Southwest Beekeepers. Beeswax wanted. Free catalog. Stiles Bee Supply Co., Stillwater, Okla.

PORTER BEE-ESCAPES save honey, time, and money. Great labor-savers. For sale by all dealers in bee supplies. R. & E. C. Porter, Lewiston, Ill.

FOR SALE — "SUPERIOR" FOUNDATION, "quality unexcelled." Let us prove it. Order now. Superior Honey Co., Ogden, Utah.

FOR SALE—Sweet clover seed, this year's crop, $2.50 per bushel in the hull. Order now and save money. The Stover Apiaries, Mayhew, Miss.

FOR SALE—A quantity of shipping cases to hold 24 sections 4 x 5 x 1½ or 1⅜, with glass, complete, cases of 25 for $10.00. A. G. Woodman Co., Grand Rapids, Mich.

HONEY CONTAINERS, one pound and one-half pound flint glass honey jars. These jars are the tall variety so popular recently. Prices are right. Heard & Woodhull, 4696 18th St., Detroit, Mich.

PATENT FOR SALE—New beehive patent Feb. 22, 1921. The one who will be pleased with it may write to this address. Dmytro Podhajny, Box 11, Algoma, W. Va.

FOR SALE—One 4-horse power gasoline engine. Just the thing to run an extractor. Have used same for this purpose for two seasons. Price $60, f. o. b. Syracuse, N. Y. Chas. G. Schamu, University Block, Syracuse, N. Y.

HUBAM, or White Annual Sweet Clover. Grow it for your bees, and get a seed crop, while the seed is scarce. Booking orders for fall delivery. E. G. Lewis Co., Media, Ills.

SHIPPING CASES—1000 12-lb. three-row shipping cases, 2-inch glass for 4¼x4¼x1½-inch plain sections. These cases are complete, KD, packed in crates of 50. Price per crate, $12.50. The A. I. Root Co., Medina, Ohio.

FOR SALE—270 24-lb. safety shipping cases for 4¼x4¼x1½ sections, flat with glass, crates of 10, per crate, $7.25; 140 24-lb. safety shipping cases for 4x5x1⅜ sections, flat with glass, crates of 10, per crate, $7.25. The A. I. Root Co., 224 West Huron St., Chicago, Ills.

FOR SALE—30 new modified Dadant hives, all frames wired, brood frames have full sheets of foundation for supers included, but not in the frames. Well nailed and painted, $6.50 each, or $180 for the lot. Brand-new 8-frame automatic reversible power extractor, and honey pump, $100. Weber Bros., Wathena, R. D. No. 4, Kans.

FOR SALE—Five-gallon square cans with 1¾-inch cork-lined screw cap, one can in case, 75c, two cans in case, $1.35. Light brood foundation in 25-lb. boxes only, per lb. 65c. Also ten-frame hive bodies, reversible bottoms and covers nailed and painted. Lake Region Honey Co., Birchwood, Wis.

MEDICINAL roots and herbs are very profitable to grow. We especially recommend growing Golden Seal, which with good care will yield as high as $10,000 per acre for each crop. It takes several years to mature but will average $1000 a year. Special Crops, a monthly paper, tells how. Sample copy, 10c; $1.00 per year. Address Special Crops Pub. Co., Box "G," Skaneateles, N. Y.

REAL ESTATE

FOR SALE—20-acre farm, 200 colonies of bees, and equipment, ¾ acre ginseng and Golden Seal. L. Francisco, Dancy, Wis.

UP-TO-DATE apiary and home in village of Eastern New York, 305 colonies, power extractor, concrete sidehill cellar, auto truck, tractor, and complete modern outfit, $10,000, half down. D. L. Woodward, Clarksville, N. Y.

FOR SALE—30 acres of land near Arcadia, Fla., bungalow house with two large porches, 40 colonies of bees, more or less; 250 colonies of bees in six apiaries along the Caloosahatchee River. Fine locations for honey, to ship bees or rear queens. No disease. Ward Lamkin, Arcadia, Fla.

FOR SALE—An improved 80-acre farm 4 miles from Iola, Kans. This farm would make an ideal place to keep bees and live stock, as every foot of it will grow sweet clover or white clover. The pastures are white with white clover, and sweet clover grows wild along the railroads and wagon roads, and is grown on cultivated land to some extent. A good local market could be developed in Iola, a county seat town of 9000 people. No large apiary close. $85 an acre takes this bargain and will carry half back into farm. Roy B. Crumb, Powhattan, Kans.

BEES AND QUEENS

FOR SALE—Italian queens, nuclei, and packages. B. F. Kindig, E. Lansing, Mich.

HARDY Italian queens, $1.00 each.
W. G. Lauver, Middletown, Pa.

SIMMONS' ITALIAN QUEENS, bees, and nuclei. Fairmount Apiary, Livingston, N. Y.

SEE our large advertisement on page 595 for prices. Buckeye Bee Co., Justus, Ohio.

WHEN it's GOLDEN, it's PHELPS. C. W. Phelps & Son, Binghamton, N. Y.

FOR SALE—100 colonies bees in lots to suit buyer. R. S. Becktell, Rifle, Colo.

GOLDEN Italian queens, untested, 1, $1.25; 6, $7.00. E. A. Simmons, Greenville, Ala.

MY famous Italian queens, June 1 and later, $1.50 each, six for $8.00. J. W. Romberger, Apiarian, 3113 Locust St., St. Joseph, Mo.

QUEENS—Three-banded Italians, untested $1.25 each; $12.00 for 12. Satisfaction guaranteed. J. D. Kroha, 87 North St., Danbury, Conn.

FOR SALE—Fine three-banded Italian queens. Untested, $1 each; 50 for $47.50; 100 for $92.50. Curd Walker, Jellico, Tenn.

FOR SALE—200 colonies of bees in eight-frame hives with supers for $8.00 each. Mrs. T. H. Carruth, Big Bend, La.

FOR SALE—Golden Italian queens, untested, $1.00; 6, $5.00. Tested, $2.00. J. F. Michael, Winchester, Ind.

PHELPS GOLDEN QUEENS will please you. Mated, $2.00; 6, $10.00; or $18.00 a doz. C. W. Phelps & Son, Binghamton, N. Y.

FOR SALE—20 colonies bees in standard L. hives, $10.00 per hive. T. A. Kragness, 6031 Wentworth Ave., Chicago, Ills.

FOR SALE—Untested Italian queens, three-banded only, $1.50 each; $8.00 per half doz., $15.00 per doz. J. F. Garretson, Bound Brook, N. J.

BEES AND QUEENS from my Carolina apiaries—progeny of my famous Porto Rican pedigreed breeding stock. Elton Warner, Asheville, N. C.

THE A. I. ROOT CO. pure leather-colored queens, untested, 1, $1.25; 6, $7.00. Greenville Bee Co., Greenville, Ala.

FOR SALE—Bright Italian queens, $1.50 each; $14.00 per doz. Ready after April 15. T. J. Talley, Greenville, R. D. No. 3, Ala.

FOR SALE—Golden queens ready May 1; 1, $1.25; 12, $10.00; 100, $85.00. Virgins, 75c each. W. W. Talley, Greenville, R. D. 4, Ala.

PROMPT shipment of Golden or three-banded queens. Untested only. One, $1.25; 6, $7.00; 12, $13.00. Safe arrival and satisfaction. Ross B. Scott, La Grange, Ind.

FOR SALE—500 colonies fully equipped, $1500, easy terms, near English colony. Very healthful, wonderful flows, local market. M. C. Engle, Herradura, Cuba.

FOR SALE—Leather-colored Italian queens from Dr. Miller's breeder. Virgins, $1.00; mated, $1.50; tested, $2.50. F. R. Davis, Standfordville, Dutchess County, N. Y.

AM now ready to mail out young queens of Dr. Miller strain leather-colored Italians, by return mail at $1.25 each. A few breeders for sale. S. G. Crocker, Jr., Roland Park, Baltimore, Md.

COLORADO QUEENS—Pure Italians. Our sunny climate and altitude produce the best there are. Write now for price list. C. I. Goodrich, breeder of fine queens, Wheatridge, Colo.

SHE-SUITS-ME queens, season of 1921. Untested Italians: After June 15, $1.50 each, up to nine queens; 10 to 24 queens, $1.40 each; 25 and up, $1.25. Allen Latham, Norwichtown, Conn.

FOR SALE—Golden queens, untested, $1.15; 6 or more, $1.10 each; select untested, $1.60; 6 or more, $1.50 each; safe arrival. Hazel V. Bonkemeyer, Randleman, R. D. No. 2, N. C.

FOR SALE—Three-banded Italian queens, untested, $1.25 each; 6, $6.50; 12, $12.00. Select untested, $1.35 each. Satisfaction guaranteed. W. T. Perdue & Sons, Fort Deposit, R. D. No. 1, Ala.

FOR SALE—Leather-colored Italian queens, tested, until June 1, $2.50; after, $2.00; untested, $1.25; 12, $13.00. Root's goods at Root's prices. A. W. Yates, 15 Chapman St., Hartford, Conn.

BEES BY THE POUND — Also QUEENS. Booking orders now. FREE circulars giving details. See larger ad elsewhere. Nueces County Apiaries, Calallen, Texas. E. B. Ault, Prop.

FOR SALE—250 colonies Italian bees in 10-frame hives, free from disease. Also supers, combs and winter cases. Locations go with bees if wanted. Fred D. Lamkin, Poplar Ridge, N. Y.

FOR SALE—Three-banded Italian queens, untested, $1.25; 6, $7.50; 12, $14.00. Tested queens, $2.50 each. The above queens are all select. Robt. B. Spicer, Wharton, N. J.

FOR SALE—Highest grade three-banded Italian queens. Untested, each, $1.00; 6, $5.50; 12, $10; 100, $75.00. Virgins, 45c each. No disease and satisfaction guaranteed. A. E. Crandall, Berlin, Conn.

FOR SALE—50 stands Italian bees, eight-frame hives, extracting super, and comb super with each colony. Also Novice extractor, and 25 half-depth extracting supers, ten-frame. Weber Bros., Wathena, Kansas.

FOR SALE—Golden Italian queens, untested, $1.15; 6 for $6.50; 12 or more, $1.00 each; tested, $2.00 each; select tested, $3.00 each; extra select tested, $4.00 each. No bees for sale. D. T. Gaster, Randleman, R. D. No. 2, N. C.

IF GOOD bright Italian queens are wanted by return mail, send your order to M. Bates, Greenville, Ala. Price, 1.00 each; $10.00 per dozen; $75 per 100. Pure mating, safe arrival, and satisfaction guaranteed.

HARDY ITALIAN QUEENS in Thompson safety-introducing cages. Day-old, any number, 50c each; untested, $1.00. Package bees and queens for 1922. Write for prices and discounts on orders booked now. James McKee, Riverside, Calif.

WE believe we have the best Italian queens obtainable. Our new system is working wonders. Book your order now for 1921. Untested, $1.25; tested, $2.25; virgins, imported mothers, 50c. Am booking orders for 1922. F. M. Russell, Roxbury, Ohio.

FOR SALE—Packages, nuclei, and pure-bred queens—queens from Root home-bred breeders. Untested, 75c; tested, $2.00. Safe arrival and mating guaranteed. The Southland Apiaries, Hattiesburg, Miss, W. S. Tatum, Prop.

FOR SALE—Unsurpassed Italian queens. Untested, 1, $1.50; 6, $7.50; 12, $14.00; 50, $55.00; 100, $105. Tested, 1, $2.50; 6, $13.50. My queens are actually laying before they are sent out. J. D. Harrah, Freewater, Oregon.

HUMMER QUEENS—Untested, $1.00 each; $9.00 per dozen; tested, $1.50 each; $15.00 per dozen. A trial will convince you that they cannot be beaten. Safe arrival and satisfaction guaranteed. Nuclei at same old prices. Geo. A. Hummer & Sons, Prairie Point, Miss.

CALIFORNIA ITALIAN QUEENS, the old reliable three-banded stock that delivers the goods. Every queen actually LAYING before being caged, and fully guaranteed. I also guarantee safe arrival. SPECIAL FALL PRICES, select untested, 1, $1.25; 6, $7.00; 12, $13.00; 25 to 99, $1.00 each; 100 and over, 90c each. Package bees for next spring delivery. Circular free. California Apiaries, J. E. Wing, Prop., 155 Schiele Ave., San Jose, Calif.

FOR SALE—Root's strain of Golden and leather-colored Italian queens, bees by the pound and nuclei. Untested, $1.50 each; select untested, $2.00; tested, $2.50 each; select tested, $3.00. For larger lots write. Circular free. A. J. Pinard, 440 N. 6th St., San Jose, Calif.

WE are now equipped to handle your early spring orders for package bees, and Italian queens, especially bred for the production of honey. Prices will be in accord with the reduction in material and labor. Safe arrival guaranteed. Write for prices and terms. Sarasota Bee Co., Sarasota, Fla.

FOR requeening, use Williams heavy laying Italian queens. They produce hardy, hustling, three-banded workers. Bred from the best disease-resisting strain, and priced in accordance with the present price of honey. Untested, $1.25; 6 for $6.50; 12 or more, $1.00 each; tested, $2.00. Satisfaction guaranteed. P. M. Williams, Ft. Deposit, Ala.

NORTH CAROLINA bred Italian queens of the Dr. C. C. Miller strain of three-banded Italian bees, gentle and good honey-gatherers, from July 1 until Oct. 1. Untested, $1.25 each; $12.00 per doz.; tested, $2.00 each; select tested, $3.00 each. Safe arrival and satisfaction guaranteed. L. Parker, R. F. D. No. 2, Benson, N. C.

QUEENS—A SUPERIOR STRAIN. Bred from a queen whose colony gathered 200 lbs. honey while the other colonies did very little. Queens, untested, $2.00 each; tested, $3.00. Doolittle strain; queens, untested, $1.25; tested, $2.00. 40 years' experience in queen-rearing. Chestnut Hill Apiary, Aspers, Pa.

FOR SALE—Italian queens: From July 1 to October 1, untested: 1, $1.25; 6, $7.00; 12, $13.50; tested, $2.00. I have a tested breeding queen from the A. I. Root Co., and will breed queens from her for those that prefer them to my old strain of hustlers. Safe delivery and satisfaction guaranteed. R. B. Grout, Jamaica, Vt.

TO MY FRIENDS, OLD AND NEW—During our buckwheat flow we rear our best queens. Hardy, prolific, disease-resistant, honey-gathering Italian stock. We have combined color and utility and each queen guaranteed to arrive safely and give satisfaction. August prices by return mail, untested, 1, $1.25; 6, $7.00; 12, $13.00; 25 for $25.00. J. B. Hollopeter, Rockton, Pa.

FOR SALE—Three-banded leather-colored bees and queens of the J. P. Moore strain, hardy, prolific, hustlers, no disease. Safe arrival and satisfaction guaranteed. Prompt attention given all orders. 1 untested, $1.00; 12, $10.00; 1 select untested, $1.25; 12, $13.50; 1 tested, $1.75; 12, $16.00; 1 select tested, 2.25; 12, $20.00. J. M. Cutts, Montgomery, R. D. No. 1, Ala.

ITALIAN QUEENS—Three-banded, select untested, guaranteed. Queen and drone mothers are chosen from colonies noted for honey production, hardiness, prolificness, gentleness, and perfect markings. Price after July 1, $1.25 each; one dozen or more, $1.00 each. Package bees a specialty. Send for circular. J. H. Haughey Co., Berrien Springs, Mich.

FOR SALE—Until further notice we are offering our bright Italian queens, untested, at $1.00 each; $10.00 per dozen; $75 per 100. We guarantee safe arrival, pure mating and reasonable satisfaction in U. S. and Canada. Cash must accompany all orders unless parties are known or satisfactorily rated. Graydon Bros., Greenville, R. D. No. 4, Ala.

PHELPS' GOLDEN ITALIAN QUEENS combine the qualities you want. They are GREAT HONEY-GATHERERS, BEAUTIFUL, and GENTLE. Virgins, $1.00; mated, $2.00; 6 for $10.00, or $18.00 per doz.; tested, $5.00. Breeders, $10 to $20. Safe arrival guaranteed only in the U. S. and Canada. C. W. Phelps & Son, Binghamton, N. Y.

AS I am continuing in charge of Apiary Inspection with the State Dept. of Agriculture, I find it necessary to sell about 100 colonies of bees, all in good equipment. All colonies are headed by young queens of my own rearing. Price f. o. b. Lansing. Ten-frame colony, $16.00; same, two-story, $20.00. Eight-frame colony, $14; same, two-story, $18.00. B. F. Kindig, East Lansing, Mich.

ANYTHING is good enough until something comes along that is better. Even a good imitation gains admiration until compared with the genuine. Likewise with queens. The market is flooded with many strains. Extravagant claims run riotous. However, quality is quickly detected by the expert. Compare Victor's Italian queens with other strains, and their superiority is noted immediately. Price: 1, $1.25; 6, $7.00; 12, $13.50. Julius Victor, Martinsville, N. Y.

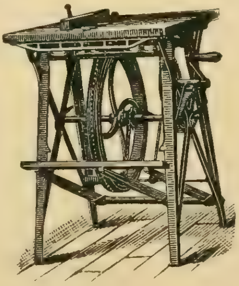
JENSEN'S QUEENS BY SELECTION—Bees in nuclei, and full colonies. Untested, $1.00 each; $9.00 per doz. Select untested, $1.25; dozen or more, $1.00 each. Tested, $1.75 each. Select tested, $3.00. Breeders, $5.00. Nuclei, two-frame with untested queen, $4.50; three-frame with untested queen, $6.00; 8-frame colony, $15.00; 10-frame, $17.50 with tested queens, in dovetailed hives, combs drawn from full sheets. Pure mating, no disease, prompt service and satisfaction guaranteed. Jensen's Apiaries, Crawford, R. D. No. 3, Miss.

ONE HUNDRED—When my brother, W. Z. Hutchinson, was living, we used to buy queens of J. P. Moore by the hundred each year to requeen our colonies. The last few years I have raised the queens we needed, breeding from the best in over 300 colonies of this strain. I know that I have improved the strain I started with. They are gentle, hardy, and good workers. We have 100 tested queens of this strain, one year or less old, for sale. In order to close them all out this month I will sell them for $1.50 each, or $16.80 per doz. They are right in their prime, first class in every respect. They should do good work another year yet. Safe arrival and satisfaction guaranteed. Elmer Hutchinson & Son, Lake City, Mich.

SITUATIONS WANTED

WANTED—Position by an experienced beekeeper in the West Indies or Central America. I would work as assistant or take charge of bees on salary or shares. G. F. Dansinger, Olean, N. Y.

BARNES' Hand and Foot Power Machinery



This cut represents our combined circular saw, which is made for beekeepers' use in the construction of their hives, sections, etc.

Machines on Trial

Send for illustrated catalog and prices.

W. F. & JOHN BARNES CO
545 Ruby Street
ROCKFORD. ILLINOIS

"Best" Hand Lantern

A powerful portable lamp, giving a 300 candle power pure white light. Just what the farmer, dairyman, stockman, etc. needs. Safe—Reliable—Economical—Absolutely Rain, Storm and Bug proof. Burns either gasoline or kerosene. Light in weight. **Agents wanted. Big Profits. Write for Catalog.** THE BEST LIGHT CO.
306 E. 5th St., Canton, O.

REQUEEN YOUR COLONIES

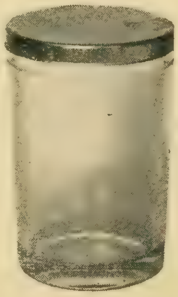
No time is better than right now to prepare for perfect wintering by requeening your colonies.
Use surplus brood for increase and give each colony of increase so made one of our young untested Italian queens.

One for	$ 1.25
Twelve for	14.00
One hundred for	98.75

Write or wire for our proposition by which we furnish honey containers free and sell your crop for cash at a small charge for our selling service that sells, and "Fosters your business."

THE FOSTER HONEY & MERC. CO.
BOULDER, COLO.

Reduced Prices on Tumblers.



We have a surplus stock of private tumblers, holding 6½ oz., put up 2 doz. in a case, including tin tops. The cost of these tumblers has more than doubled in last three years. 1249 cases 6½-oz. private tumblers, 2 doz. in each case, 60c; per 10 cases, $5.50; 100 cases, $50.00. Prices f. o. b. Philadelphia.

Send all orders direct to
THE A. I. ROOT CO., MEDINA, OHIO

QUIGLEY QUALITY QUEENS

are bred from ideal colonies by double grafting, producing Superior Queens, being bred to our 13-frame Standard Hive capacity. 20 years breeding this strain. No disease. Purity and satisfaction guaranteed. Tested, $2.00. Untested, $1.25; six or more, $1.00 each. Can supply 100 in September.

E. F. QUIGLEY & SON
Unionville, Mo.

A Superior Quality at Less Cost

SUPPLIES

A Superior Quality at Less Cost

These supplies are made by the Diamond Match Co., and are of a superior quality. Hives, Supers, etc., listed below, are in the flat, and are complete with Hoffman frames, metal rabbets, and all inside fixtures.

One-Story Dovetailed Hives

Five 8-frame	$13.50
Five 10-frame	14.30

Shallow Extracting Supers.

Five 8-frame	$5.00
Five 10-frame	5.50

Full-Depth Supers

Five 8-frame	$6.70
Five 10-frame	7.60

No. 1 Style Comb Honey Supers.

Five 8-frame	$4.80
Five 10-frame	5.25

Standard Hoffman Frames.

100	$7.20
500	33.00

Our Incomparable Quality Foundation

Medium Brood

5 lbs.	74c per pound
25 lbs.	73c per pound
50 lbs.	72c per pound

Thin Super

5 lbs.	80c per pound
25 lbs.	79c per pound
50 lbs.	78c per pound

Light Brood

5-lb. lots	76c per pound
25-lb. lots	75c per pound
50-lb. lots	74c per pound

Aluminum Honeycombs as now made by Duffy-Diehl Co. are meeting with success. We carry these in stock to supply Eastern beekeepers.

HONEY! HONEY! HONEY!

Beekeepers who are suppying Honey to a regular family trade, or who are located along the highways, and are supplying motorists, know that their customers want a honey of a uniform color and flavor. And unless the honey is at all times uniform in color and flavor, customers sometimes become dissatisfied. Our special blend of Fancy Honeys (liquid) is always uniform and is of a fine mild flavor, and will satisfy the most exacting trade.

Special Blend of Fancy Honey (Liquid)

60-lb. Tins, 2 per case	14c lb.
10-lb. Tins, 6 per case	16c lb.
5-lb. Tins, 12 per case	17c lb.
2½ lb. Tins, 24 per case	18c lb.

Various Grades, Crystallized, 60-lb. Tins

Water White Orange	14c lb.
Water White Sweet Clover	12c lb.
Extra Light Amber Sage	11c lb.
N. Y. State Buckwheat	10c lb.

Pure Vermont Maple Sap Syrup, case of 12 tins, $14.00.

GLASS AND TIN HONEY CONTAINERS

2½-lb. Cans, 2 dozen reshipping cases, $1.45 case; crates of 100	$ 6.50
5-lb. Pails (with handles), 1 doz. reshipping cases, $1.35 per case; crates of 100	8.30
10-lb. Pails (with handles), ½ doz. reshipping cases, $1.10 case; crates of 100	12.75
60-lb. Tins, 2 per case—NEW, $1.30 case; USED	.30

White Flint Glass, With Gold Lacquered Wax Lined Caps.

8-ounce Honey Capacity, Cylinder Style,	$1.50 per carton of 3 dozen
16-ounce Honey Capacity, Table Jar Service	$1.40 per carton of 2 dozen
Quart or 3-pound Honey Capacity, Mason Style	$1.00 per carton of 1 dozen

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HOFFMAN & HAUCK, INC.

WOODHAVEN, NEW YORK

Make Your Bees Pay!

If you want bigger honey profits, **get the best queens you can buy.** This is the secret of successful bee-raisers. Hundreds of America's greatest honey producers order Forehand's 3-banded Italian Queens. Follow their example. Order from Forehand and be sure of satisfactory results. Backed by 28 years' successful experience in queen-breeding and honey production. Take no chances. Experimenting is costly. So certain am I that my queens will satisfy you, that I will gladly replace unsatisfactory queens delivered in U. S. or Canada, or refund your money. You be the judge and jury. Can anything be fairer?

Prices August 1st to Nov. 1st.

	1	6	12
Untested	$1.00		$10.00
Selected Untested	1.25		12.00
Tested	2.50	$13.00	24.00
Selected Tested.	3.00	16.50	30.00

Bees in two-pound packages: 1 package, $6.00; 25 or over, $5.80; 50 or over, $5.40; 100 or over, $5.00, without queens.

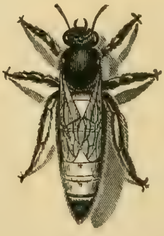
Place your order now. Prices low, quality considered. Write for circular and discount on large orders.

N. Forehand

Ramer, Alabama

Breeder of 3-banded Italian Queens Exclusively.

Queens that look like this. Bred for quality rather than quantity.



Guaranteed to give satisfaction. Prompt service, quality and mating guaranteed.

SOUTHLAND QUEENS

Three-Banded Leather-Colored Italians—Bred from Selected Root Home-Bred Breeders —Backed by Over Fifty Years in Breeding the Best Queens.

Untested ....$0.75 each
Selected Untested .... 1.00 each

Tested $2.00
Breeders.........$5.00 to $15.00

POUND PACKAGES

Shipped on comb of fdn.

One-pound bees, no queen...$2.00
Two-pound bees, no queen.. 3.75
Three-pound bees, no queen. 5.25

NUCLEI

One-frame, no queen.......$2.00
Two-frame, no queen....... 3.75
Three-frame, no queen 5.25

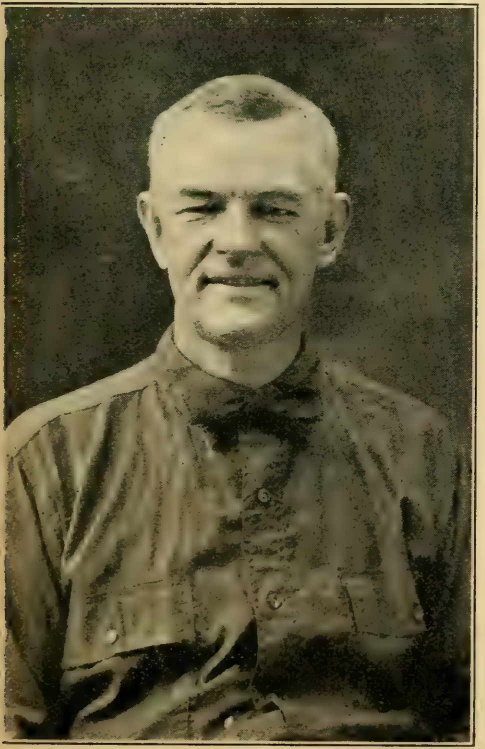
Distributors for Root Quality Bee Supplies. We are the beekeepers' bargain house. It will pay you to get our prices. Catalog on request. Shipments direct from factory at our prices.

THE SOUTHLAND APIARIES, HATTIESBURG, MISS.

QUEENS

Our bees are so busy raising queens that I cannot afford whiskers this month. Besides, several customers have written me, saying they were tired of those whiskers and recommended a shave. Now as I have complied with those requests, I hope you will comply with mine and send in your order for some of our High-grade Italian Queens and become one of the large number of our satisfied customers. We are now enjoying a light honey flow from Blue Vine, making the conditions ideal for producing the very best queens. In addition to this, we give the larvae the right start in the Swarm Box and finish the cells in powerful colonies, so populous as to crowd a two-story Jumbo hive. Cells are given to strong nuclei, and the young virgin receives the best care at all times. No queens are hatched in nursery cages. I give the fullest guarantee with every queen sent out, and will glady replace any that proves other than first class. If the present favorable weather continues, I will be able to make prompt shipments.

Our Guarantee: I guarantee pure mating, safe arrival, and that all queens shall be first class, leaving it to the customer to be the judge.



"Half Way Tree P. O.,
"Jamaica, B. W. I.

"Dear Mr. Smith:

"Received the queen you sent all O. K. She is just splendid and vigorous. I have nearly finished requeening my apiary with the stock I bought from you last year. Their progeny are true to type and color, laying so profusely that I shall have to give them another super besides the brood-chamber in which to lay. I must say again how satisfied I am. Very faithfully,

"OTTO HOLT."

Price List for the Remainder of the Season

One to four inclusive......	$2.00 each
Five to nine inclusive......	1.95 each
Ten or more..............	1.90 each
Breeders, our very best....	12.00 each

A card will bring
our catalog.

JAY SMITH, ROUTE 3, VINCENNES, IND.

Queens of
MOORE'S STRAIN
OF ITALIANS
PRODUCE WORKERS

That fill the super quick
With honey nice and thick.

They have won a world-wide reputation for honey-gathering, hardiness, gentleness, etc. Untested queens, $1.50; 6, $8.00; 12, $15.00. Select untested $2.00; 6, $10.00; 12, $19.00.

I am now filling orders by return mail. Safe arrival and satisfaction guaranteed. Circular free.

J. P. MOORE, Queen Breeder
Route 1, Morgan, Kentucky.

Three-Band and Golden
QUEENS

That produce hustling bees. Bred to fill the supers. From the finest breeding strains obtainable. Hustlers, long-lived, and as beautiful in size and color as can be. Special price for summer and fall. Untested, $1.25 each; 12 at $1.00 each. Tested, $2.00 each. Breeders, $10.00. This is your time to requeen.

DR. WHITE BEE CO.
SANDIA, TEXAS.

INDIANOLA APIARY

will furnish 3-banded Italian bees and queens: Untested queens, $1.00 each; tested, $1.50 each. One pound bees, no queen, $2.00. No disease.

J.W.SHERMAN,VALDOSTA,GA.

GOLDEN OR THREE-BAND QUEENS.

Untested, balance of season, $1.00 each; doz. $10.00, or $80.00 per hundred. Virgins, 50c each, or $40.00 per hundred. All orders filled promptly or parties notified when to expect shipment; satisfaction.

R. O. COX, Rt. 4, Luverne, Ala.

Thagard Italian Queens

—BRED FOR QUALITY—

Untested: 1, $1.25; 6, $6.50, 12, $11.50.

V. R. THAGARD
GREENVILLE, ALA.

Spicer's Three-Banded
ITALIAN QUEENS

now ready to mail. These queens are bred so as to have all the desired qualities, hustlers, hardy, and gentle.

	1	6	12
Untested queens.	$1.25	$7.50	$14.00
Tested queens...	2.50	15.00	28.00

I do not list select queens, as the above are all select. Safe arrival and satisfaction guaranteed.

ROBERT B. SPICER
WHARTON, N. J.

"QUEENS OF QUALITY"

3-BAND ITALIANS ONLY.

Untested, $1.25 each; six for $7.00; $12.00 per dozen.

We are now shipping by return mail.

J. I. BANKS
DOWELLTOWN, TENN.

Queens—Rhode Island—Queens

Italian Northern-bred queens. Very gentle and hardy. Great workers. Untested, $1.25 each; 6 for $6.

Queens delivered after June 1.

O. E. TULIP, Arlington, Rhode Island
56 Lawrence Street.

NEW ENGLAND

BEEKEEPERS will find a complete stock of up-to-date supplies here. Remember we are in the shipping center of New England. If you do not have a 1921 catalog send for one at once.

H. H. Jepson, 182 Friend St, Boston 14, Mass.

STUTT'S ITALIAN QUEENS

are supreme queens; ready June 1. Untested, $1.25; 6, $6.50; 12, $12.50. Select untested, $1.50; 6, $8.00; 12, $15.00. Pure mating and safe arrival guaranteed.

ALFRED A. STUTT, Lincoln, Ills.

LOCKHART'S SILVER-GRAY CARNIOLANS

"LINE BRED" for the past 33 years. They are VERY hardy, gentle, prolific, great workers, and builders of VERY WHITE comb, and use mostly wax in place of propolis. Prices of queens for 1921: Untested queens, $1.00; select untested, $1.50; tested, $2.50; select tested, $3.00. Breeders, $5.00, $10.00. Safe arrival guaranteed in U. S. and Canada. No foul brood here.

F. A. LOCKHART & COMPANY - - LAKE GEORGE, NEW YORK

QUALITY TIN CANS FIRST

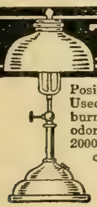
For PACKERS and MANUFACTURERS of FOOD PRODUCTS

LARGE CAPACITY LONG EXPERIENCE

YOUR INQUIRIES SOLICITED

W. W. BOYER & CO. INC.

BALTIMORE, MD.


The "BEST" LIGHT

Positively the cheapest and strongest light on earth. Used in every country on the globe. Makes and burns its own gas. Casts no shadows. Clean and odorless. Absolutely safe. Over 200 styles. 100 to 2000 Candle Power. Fully Guaranteed Write for catalog. AGENTS WANTED EVERYWHERE.

THE BEST LIGHT CO.
306 E. 5th St., Canton, O

World's Best Roofing at Factory Prices

"Reo" Cluster Metal Shingles, V-Crimp, Corrugated, Standing Seam, Painted or Galvanized Roofings, Sidings, Wallboard, Paints, etc., direct to you at Rock-Bottom Factory Prices. Positively greatest offer ever made.

Edwards "Reo" Metal Shingles

cost less; outlast three ordinary roofs. No painting or repairs. Guaranteed rot, fire, rust, lightning proof.

Free Roofing Book

Get our wonderfully low prices and free samples. We sell direct to you and save you all in-between dealer's profits. Ask for Book No. 183

LOW PRICED GARAGES

Lowest prices on Ready-Made Fire-Proof Steel Garages. Set up any place. Send postal for Garage Book, showing styles.

THE EDWARDS MFG. CO.,
933-983 Pike St., Cincinnati, O.

FREE
Samples &
Roofing Book

NEWMAN'S ITALIAN QUEENS BRED FROM THE BEST ABSOLUTELY FIRST QUALITY and fully guaranteed. No disease. Satisfaction and safe arrival. Untested, $1.25; 6, $7.00; 12, $13.50. Select Untested, $1.75; 6, $9.00; 12, $17.00. Circular free.

A. H. NEWMAN, Queen Breeder
MORGAN, KY.

Established 1885.
Write us for catalog.

ALWAYS
ON
TOP

BEEKEEPERS' SUPPLIES

The Kind You Want and the Kind That Bees Need

We have a good assortment in stock of bee supplies that are mostly needed in every apiary. The A. I. Root Co.'s brand. Let us hear from you; information given to all inquiries. Beeswax wanted for supplies or cash.

John Nebel & Son Supply Co.
High Hill, Montgomery Co., Mo.

LARGE, HARDY, PROLIFIC QUEENS

Three-band Italians and Goldens. Pure mating and safe arrival guaranteed. We ship only queens that are top notchers in size, prolificness, and color. After June 1st: Untested queens, $1.50 each; 6 for $8.00; 12 or more, $1.40 each; 25 or more, $1.25 each. Tested queens, $3.00 each; six for $16.00.

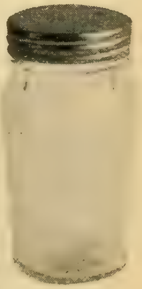
Buckeye Bee Co., Justus, Ohio.

ROOT'S BEE SUPPLIES

Carload stocks at Ohio's distributing center. Orders filled the day they come in. Save time and freight by ordering from

A. M. MOORE, Zanesville, Ohio
22½ S. Third Street.

Reduced Prices on Glass Jars.



We have discontinued handling taper jars of 9-ounce capacity, and therefore offer you these attractive receptacles, including lacquered tin tops, at reduced prices. We have 576 cases on hand and have priced them for quick clearance as follows: Per case, 85c; per 10 cases, $8.00; per 100 cases, $75.00; 2 doz. in case. Prices f. o. b. Philadelphia.

Send all orders direct to
THE A. I. ROOT CO., MEDINA, OHIO.

Slum Gum Old Combs

worked into beeswax at 5c per pound, minimum charge $1.00. Pay taken from wax.

Market price paid for the wax, worked into foundation, or traded for supplies.

Working Beeswax into foundation is a specialty with us.

Ship to Falconer, New York. Mark each package with your name and address both inside and outside.

Write for Red Catalog of Beekeepers' Supplies and REDUCED price list.

W. T. Falconer Mfg. Co.
Falconer, N. Y., U. S. A.

"Where the best beehives come from."

QUEENS

Select Three-Banded Italians. I have one of the most modern queen-rearing apiaries in the South, and am breeding from the best Italian stock to be found. Pure mating, prompt and safe arrival guaranteed.

	1	6	12	50
Untested	$1.25	$7.00	$13.00	$50.00
Tested	3.00	16.00	30.00	

Write for descriptive circular and prices on queens in lots of 100 or more.

HARDIN S. FOSTER
Dept. G, Columbia, Tenn.

PATENTS Practice in Patent Office and Court. Patent Counsel of The A. I. Root Co.
Chas. J. Williamson, McLachlan Building,
WASHINGTON, D. C.

Every Step in Beekeeping

By Benjamin Wallace Douglass

A brand-new book based on the most up-to-date scientific information and thorough practical experience that tells how to keep bees for profit.

A book of directions, every step made clear, so that the beginner may start right and go forward without floundering. Delightfully written. Author was formerly State Entomologist of Indiana and has been a successful beekeeper for years.

Illustrated with thirty-one photographs. Price $2.50. Sent postpaid on approval to any subscriber to this magazine.

THE BOBBS-MERRILL CO.
Vermont Plaza, Indianapolis, Ind.

To the Beekeepers Who Purchase Bees in Packages

Do not worry about *Express Charges, loss in Transit, and Delay.* We are going to do this for you.

Did you realize that a nice frame of emerging bees is equal to a pound of bees. In 1922, we will be back to pre-war price and better service.

The above is for May and June delivery, 15 per cent with order, balance 15 days before date of shipment.

2 lbs. bees, and 1 good Untested Three-banded Queen on frame of emerging bees	$6.25
3 lbs. as above	7.50
2-frame nucleus with queen	6.25
3-frame nucleus with queen	7.25

OUR GUARANTEE.

Express paid. All dead bees promptly replaced. Government health certificate with each shipment. Simply have your Express Agent sign bad order report and mail same to us at once. You take no chance. Order now so as not to be disappointed. Write for discount on 100 or more packages.

THE HOME OF GOOD QUEENS.
OSCAR MAYEUX
HAMBURG, LOUISIANA.

Quality Bee Supplies From a Reliable House

Without fear or favor, I place my BEE SUPPLIES and SERVICE before you.

It is the small annoyances that often grow into disastrous results. Avoid the so-called "little losses" by using MONDENG'S goods. Quality is first—save time when you put your goods together by getting supplies that are accurately made. Service is next—no delays when bee supplies are ordered from my factory.

I am ready to meet your urgent needs. Send for my latest price-list.

Closing out all Langstroth and Wisconsin hives and supers. Also Langstroth triangular top-bar frames, and eight-frame D. T. supers for 4 x 5 sections. At cost price. Write for quotations.

Charles Mondeng

146 Newton Ave. N. &
159 Cedar Lake Road.
MINNEAPOLIS, MINNESOTA.

Beeswax Wanted

In big and small shipments, to keep Buck's Weed-process foundation factory going. We have greatly increased the capacity of our plant. We are paying higher prices than ever for wax. We work wax for cash or on shares.

ROOT BEE SUPPLIES

Big stock, wholesale and retail. Big catalog free.

Carl F. Buck

The Comb-foundation Specialist
AUGUSTA, KANSAS
Established 1899.

Completely Destroys the Weed Growth

More than that, the BARKER breaks the hardest crust into a level, porous, moisture-retaining mulch — **all in the same operation.**

A ten-year-old boy can run it—do more and better work than ten men with hoes. Saves time and labor, the two big expense items.

BARKER WEEDER, MULCHER AND CULTIVATOR

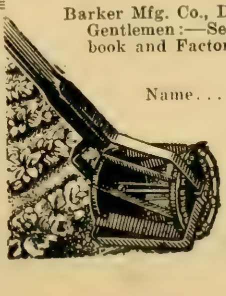
Eight reel blades revolve against a stationary underground knife—like a lawn mower. **BEST WEED KILLER EVER USED.** Works right up to plants. Cuts runners. Aerates the soil. Has leaf guards, and shovels, for deeper cultivation—3 *garden tools in* 1.

FREE ILLUSTRATED BOOK.

Tells how gardeners and fruit-growers everywhere are reducing their work; increasing their yields.—How to bring growing plants through a dry season.—How to conserve the moisture and force a larger, more rapid growth. Send TODAY for this free, illustrated book and special Factory-to-User offer.

BARKER MANUFACTURING COMPANY

Dept. 23. David City, Neb.



Barker Mfg. Co., Dept. 23, David City, Neb.
Gentlemen:—Send me postpaid your free book and Factory-to-User offer.

Name........................

Town...............

State..................

R. F. D. or Box..........

HUBAM

The Great Honey Bearing Clover

PRACTICAL experience with Hubam, the annual white sweet clover discovered by Prof. Hughes, is proving that it surpasses expectations in the richness of its honey-bearing content. It blooms in three to four months and continues blooming for a longer period than other honey-bearing plants.

These advantages promise to make Hubam an influence of the first importance in the business of beekeeping. It will establish a new low standard of costs and enlarged production. The use of Hubam is rapidly becoming a necessity for the successful beekeeper.

Quick growth and an unusual wealth of honey-making blooms are combined with a legume action that returns large quantities of valuable plant food to the soil.

We are large-scale growers of Hubam seed with acreages in Texas, Ohio, and North Dakota. To prevent accidental mixing of seeds we grow only Hubam clover and guarantee the purity of the seed.

Some seed of the 1921 crop is now available.

THE DE GRAFF FOOD COMPANY
Seed Department, 303
DE GRAFF, OHIO

Leininger's Strain of Italian Queens

Have been carefully selected and bred for the past 38 years. Our queens are reared from selected stock taken from the best strains of Italian bees known. Neither trouble nor expense is spared to produce queens of unsurpassed quality. They have proved themselves to be not only great honey-gatherers but also very resistant to brood diseases.

We will have 400 select tested queens that we will sell as long as they will last at the folowing special prices:

PRICE LIST OF QUEENS.

Untested, $1.50 each; 6 to 25, $1.40 ea.
Sel. Tested, $3 each; 6 to 25, $2.75 ea.
Breeding queens, $10.00 each.

Every queen we send out we will guarantee to give fullest satisfaction.

FRED LEININGER & SON
DELPHOS, OHIO.

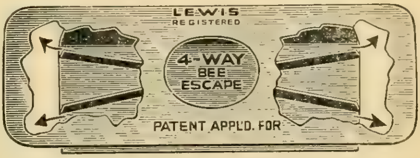
Buy Your Bee Supplies Now

Take advantage of early-order discounts by ordering NOW. We guarantee to please you. "Prompt service and the very best" is our motto. *We want your beeswax and old comb.* Highest cash and trade prices offered. Texas beekeepers should write A. M. HUNT, Goldthwaite, Texas.

Manufactured by

Leahy Manufacturing Company
95 Sixth St., Higginsville, Missouri
Write for FREE catalog. It is to your interest.

LEWIS 4-WAY BEE ESCAPES



Four exits from supers. Fits all standard boards. Springs of coppered steel. Made of substantial metal. Price each 20c postpaid. Made by

G. B. Lewis Company, Watertown, Wis., U.S.A.
Sold only by Lewis "Beeware" Distributors.

Northwestern Headquarters for Italian Queens

The queen is the life of the colony. You cannot afford to keep poor queens or a poor strain of bees. I have been in the bee business for more than twenty years and have made every effort to improve the honey-gathering qualities of my bees by purchase of breeders and by select breeding. I believe that my bees are unsurpassed by any. When you buy Untested Queens from me you are getting select untested queens. I will begin mailing queens about June 1.

PRICES: June 1 to October 1: Untested Italian Queen—1, $1.50; 6, $7.50; 12, $14.00; 50, $55.00; 100, $105.00. Tested Italian Queen—1, $2.50; 6, $13.50.
I have no pound packages or nuclei for sale.

J. D. HARRAH, ROUTE 1, FREEWATER, OREGON

BANKING BY MAIL AT 4%

SAFETY AND 4% INTEREST

No matter where you may be located, you can deposit your money BY MAIL in absolute safety at 4% interest in this strong bank. Send your first deposit today and lay the foundation for future financial independence.

THE SAVINGS DEPOSIT BANK CO.

A.T.SPITZER, Pres.
E.R.ROOT, Vice Pres. E.B.SPITZER, Cash.
MEDINA, OHIO

America's

greatest corporations have learned the expediency of planning their policies for many years ahead. This is one of the reasons why these stalworth enterprises go right on expanding through all sorts of business weather.

Mr. O. J. Jones of Wichita, Kansas, not only plans ahead, but plans well. He is a well-known Kansas beekeeper and president of the State Beekeepers' Association. In his letter of July 4th he tells us of one of the very vital plans of his business. He believes that the success of his business depends on good bees, and for that reason he is planning to head his apiaries with Forehand's Three Bands. This is his plan:

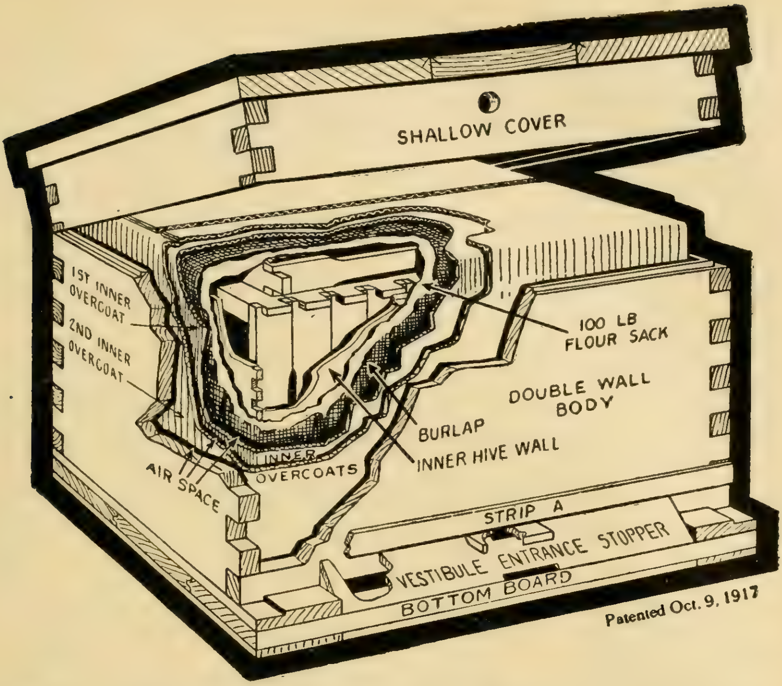
> "I have tested out stock from your queens, side by side with stock from other southern queen-breeders, for the past four years. I have found yours giving much better results in almost every instance, averaging a much higher degree of efficiency. So well satisfied with the results from your stock am I that I am rearing all my queens from some very fine breeders that I have purchased from you, or their offsprings."

These breeding queens were selected from some of our untested queens.

PRICES—Untested: 1, $1.25; 6, 6.50; 12, $11.50; 100, 90c each. Select Untested: 1, $1.50; 6, $7.50; 12, $13.50; 100, $1.00 each. Tested: 1, $2.00; 6, $10.00; 12, $18.50. Select Tested: 1, $2.75; 6, $15.00; 12, $27.00.

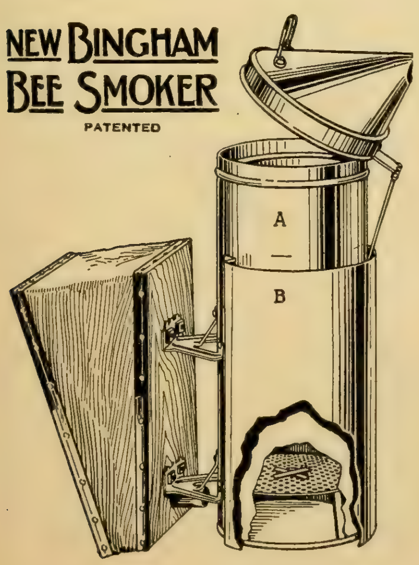
We guarantee pure mating and satisfaction the world over. Safe arrival in the United States and Canada.

W. J. Forehand & Sons
Fort Deposit, Ala.


SHALLOW COVER
1ST INNER OVERCOAT
2ND INNER OVERCOAT
100 LB FLOUR SACK
DOUBLE WALL BODY
BURLAP
INNER HIVE WALL
INNER OVERCOATS
AIR SPACE
STRIP A
VESTIBULE ENTRANCE STOPPER
BOTTOM BOARD
Patented Oct. 9, 1917

Winter Problem Solved by the Hive with an Inner Overcoat.

It will pay you to try out a sample shipment of these hives the coming winter. The outside walls are made of ⅞ material and will last a lifetime. Material and workmanship guaranteed to please you. The Inner Overcoats furnish the close-up protection which brings the bees through the winter in fine condition. We can make prompt shipment and prices have been reduced. Your order will have our prompt attention.


NEW BINGHAM
BEE SMOKER
PATENTED
A
B

BUY BINGHAM BEE SMOKERS.

On the market over 40 years. The bellows of best quality sheepskin is provided with a valve, which gives it pep and makes it respond quickly to the most delicate touch, giving as much or as little smoke as is required. The Big Smoke size, stove 4 x 10 inches, with asbestos-lined shield, permits the holding of the smoker between the knees without danger of burning the trousers or one's legs. This size is much appreciated by extensive operators.

SPECIAL SALE HONEY PACKAGES

Get our latest reduced prices on all honey packages. Let us add you to our large list of pleased customers on this line of merchandise. Special prices on shipments from factories direct to customer. Sixty-pound cans in bulk and in cases. Friction-top pails and cans all sizes. Clear flint glass, Mason jars pints and quarts, tumblers, pound jars and other sizes. Get on to our list, so as to get quotations.

A. G. WOODMAN COMPANY
Grand Rapids, Michigan.

QUEENS FULL COLONIES AND NUCLEI **QUEENS**

Our bees are hustlers for honey, prolific, gentle, very resistant to European Foul Brood, our customers tell us. For years we have been shipping thousands of queens and pounds of bees all over the U. S. A. and Canada. We are continually getting letters with statements such as the following: "Well pleased with your stock," "Best we ever had," "The bees we got from you are the tops (best) we have in our 225 colonies," "Bees arrived in fine shape, well pleased," etc., etc. Write for circulars giving details, etc. We are quoting a lower price for balance of the year, but will still hold up the high standard of quality.

I have a good proposition for 2 or 3 Northern beekeepers that would like to come South this fall. Write for particulars.

QUEENS AFTER JULY 1st, BALANCE OF THE YEAR:

Untested	$1.35 each	25 or more, $1.00 each
Select Unt.	1.50 each	25 or more, 1.25 each
Tested	2.25 each	25 or more, 1.75 each
Select Tested	2.75 each	25 or more, 2.00 each

1 lb. of bees	$2.25 each	25 or more, $2.13 each
2 lbs. of bees	3.75 each	25 or more, 3.56 each
3 lbs. of bees	5.25 each	25 or more, 4.98 each

Add price of queen wanted when ordering bees.

Safe arrival guaranteed within six days of here.

NUECES COUNTY APIARIES

E. B. AULT, Prop. **CALALLEN, TEXAS**

Select Three-Banded Italians of the Highest Quality

One Grade

800 honey-gathering colonies from which to select the very best breeders. No one has better bees than I. Can make prompt delivery by return mail. I have not yet disappointed a customer.

A new customer from Missouri where you have to show them, writes: "The dozen queens arrived promptly. They are the most beautiful I ever saw."—(Name on request.)

Another one from the same state writes: "Your 100 2-lb. packages averaged 90 lbs. surplus honey per colony, 10 lbs. more per colony than the other 2-lb. packages purchased elsewhere."—H. H. Thale, Durham, Mo.

Now listen to this, from Ontario, Canada: "Bees and queens purchased of you last season all wintered without a single loss. Save me 50 untested queens for May delivery."—(Name on request.)

My customers say my queens stand the northern winters. They are bred up for this, combined with the highest honey-gathering qualities and prolificness.

Pure mating, safe arrival and satisfaction guaranteed. It is left with customer to say what is satisfaction.

Prices for balance of season: 1 Untested Queen, $1.00; for 6, $5.50; for 12 or more, $10.00 per dozen. Tested Queens, $2.00 each.

JASPER KNIGHT, HAYNEVILLE, ALA.

FOR YOUR 1921 CROP

Comb honey shipping cases, honey cans, friction-top pails. Price on application.

Early order cash discount on sections, hives, supers, frames, comb foundation, and other goods.

Buy now and get supplies ready for 1922. Make out your list, and send for our prices.

AUGUST LOTZ COMPANY, BOYD, WIS.

SIGNS LABELS CARTONS

Candy would be just as sweet if packed in a shoe box, but it will not sell as well.

EFFICIENT SIGNS, LABELS, AND CARTONS WILL SELL HONEY AT GOOD PRICES.

We have them

SIGNS---

In two colors, printed both sides, 19½ x 28 inches. Postpaid, 80c.

LABELS---

Send for catalog of 100 full-sized designs in one, two, and three colors. All sizes. Prices right.

CARTONS---

All sizes plain or with your address. Cartons will bring repeat orders for comb honey.

Send for

THE ROOT SPECIAL

LABEL CATALOG

CONTAINER PRICE LIST

THE A. I. ROOT COMPANY
MEDINA, OHIO

There is a Root Dealer near you

10,299 Queens

Reared this season to August first, all sold and could have sold more. Why? Because the thousands we have sold must have given satisfaction.

If you haven't already, experts advise you to requeen NOW. We can furnish you the queens that will deliver you the goods.

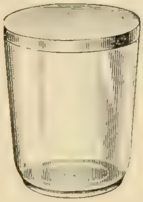
Untested, 1 to 12......	$1.00 each
Untested, 12 or more..	.75 each
Tested, 1 to 12........	2.00 each
Tested, 12 or more....	1.50 each
Breeders....$5.00 to	$25.00 each

Safe arrival and satisfaction guaranteed. Return dead and unsatisfactory queens.

The Stover Apiaries

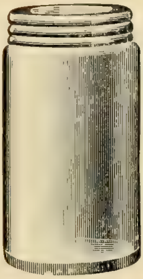
Mayhew, Mississippi

Money Saving Prices on Honey Containers



Our 6½-oz. size tumbler is used extensively wherever a small package of honey is required. Tumblers have tin caps and waxed paper for making a tight seal. Packed complete in boxes or barrels at the following prices:

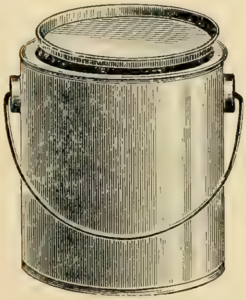
Cat. No.	Weight	Price
B442102—6½-oz. tumblers, 48 to case....	20 lbs.	$1.65
B442103—6½-oz. tumblers, 480 to barrel.	190 lbs.	14.80



16-OZ. ROUND JARS

Extracted honey will sell readily in a neat attractive, leak-proof glass container. A little money saved on your glass containers often prevents repeat orders for your goods. We have sold large quantities of these jars and we fully recommend them as being the best package, price considered, on the market today.

B442101—16-ounce round jar, weight per case of 24, 18 lbs., per case........................$1.70



FRICTION-TOP CANS AND PAILS

For retailing honey in large packages direct to the consumer we know of nothing better than the friction-top cans and pails.

Cat. No.	Size of Containers.	Weight.	Price.
B442018	—2½-lb. can, box of 24....	16 lbs.	$1.60
B442025	—2½-lb. can, carton of 116.	35 lbs.	5.00
B442026	—5-lb. can, carton of 50..	25 lbs.	4.00
B442020	—5-lb. can, box of 12......	16 lbs.	1.45
B442021	—10-lb. pail, box of 6......	15 lbs.	1.20
B442027	—10-lb. pail, carton of 50..	45 lbs.	6.00

Price List of Regular Shipping Cases

All our cases are single tier for 24 sections. When in flat, nails and two-inch glass strips with grooved wood strips and end-blocks are included.

Size of section.	In flat with glass, in lots of			In flat, no glass			Wt.
		10	100		10	100	100
4¼x4¼x1⅞	B202010	$6.00	$58.18	B202020	$5.85	$56.55	360
4¼x4¼x1½	B202050	5.88	56.88	B202060	5.72	55.25	340
4 x5 x1⅜	B202090	5.88	56.88	B202100	5.72	55.25	340
4¼x4¾x1⅜	B202130	5.88	56.88	B202140	5.72	55.25	340
3⅝x5 x1½	B202170	5.88	56.88	B202180	5.72	55.25	340

We take special pains to pack glass for safe shipment and will not be responsible for breakage.

New EMBOSSED METAL SIGNS, "HONEY FOR SALE," 8 x 14 inches. White letters on blue ground. Price, $1.00 postpaid.

THE A. I. ROOT COMPANY
MEDINA, OHIO
And Root Dealers Everywhere

WE CANNOT STOP LEST YOU LOSE

(One of many lumber alleys at the "Beeware" plant.)

While bees work on fall flowers, lumber piles up here.
No shortage may be allowed to delay your shipments.
Lest beekeepers be disappointed we cannot stop.
Even in dull seasons our experts must be retained.
The quality of "Beeware" must be kept up.

* * * * * * * *

Write for special quotations in August & September.
"Beeware" trademark insures quality and service.

* * * * * * * *

BEE HIVES AND APIARIAN EQUIPMENT
BEWARE
WHERE YOU BUY YOUR
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Gleanings in Bee Culture

Fall Days in Canada

VOL. XLIX OCTOBER, 1921 NUMBER 10

Queens

We are now in a position to accept orders for queens in large quantities. Each queen selected and prepared for mailing by Henry Perkins, our Queen-breeder. They are going out in every mail, and to have yours in time to use this season, better get your order in the next mail.

Prices on bee supplies cut to pre-war time. Write for quotations.

Miller Box Manufacturing Co.
201-233 N. Avenue Eighteen
Los Angeles, Calif.

"Griggs saves you freight."

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By the time you read this our 1921 crop will be history. How about your Honey Cans, Comb-honey Cases, Extractors? Let us know your wants. We can serve you promptly and well.

Honey, New Crop

Send sample and say how much you have, kind, how packed, and price asked in first letter.

Beeswax always wanted.

THE GRIGGS BROS. CO.
Dept. 25 **Toledo, O.**

"Griggs saves you freight."

HEADQUARTERS

for the full line of

Beekeepers' Supplies

at

Prices Reduced

from those in effect a year ago from

10 to 40 Per Cent

When in need of goods try our

Quality and Service

We believe you cannot beat it.

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OF CALIFORNIA
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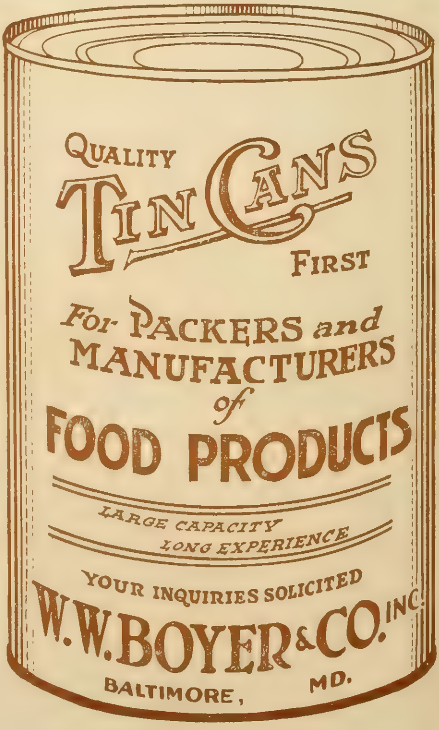
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For Packers and Manufacturers of
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Long Experience
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Editorial Staff

Geo. S. Demuth and E. R. Root	A. I. Root	H. H. Root	H. G. Rowe
Editors	Editor Home Dept.	Assistant Editor	M'n'g Editor

Honey ***Wanted*** *Honey*

We are in the market for both comb and extracted. Send sample of extracted, state how put up, with lowest price, delivered Cincinnati. Comb honey, state grade and how packed, with lowest price, delivered Cincinnati. We are always in the market for white honey, if price is right.

C. H. W. Weber & Co.
2163-65-67 Central Av., Cincinnati, Ohio

HONEY CANS

Several carloads just received at our Ogden and Idaho Falls warehouses. We also manufacture shipping cases and beehives. Special prices on request. ''Everything in Bee Supplies.'' Prompt shipments.

SUPERIOR HONEY CO., OGDEN, UTAH
(Manufacturers of Weed Process Foundation.)

Indianapolis Can Give You Some Real Beekeeping Service

WE SHIP YOUR ORDER THE SAME DAY IT IS RECEIVED. LET US GIVE YOU SOME OF THIS SERVICE. CATALOG FOR THE ASKING. WRITE FOR PRICES ON BEESWAX.

THE A. I. ROOT COMPANY
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Have You Sold Your Honey?

We are buying COMB and EXTRACTED honey. Send us a sample and tell us what you have to offer. Name your most interesting price delivered to Cincinnati. Remittance goes forward the day shipment is received.

Old Comb—Don't forget we render wax from your old combs and cappings. Write us for shipping tags.

* * * * * * *

We Offer You Friction-Top Cans

2½-lb. cans	$ 4.25 per 100	$ .50 per 10
5 -lb. cans	8.00 per 100	1.00 per 10
10 -lb. cans	12.00 per 100	1.40 per 10

1-lb. Round Screw Top Jars, 2 doz. in shipping case,
10-case lots..........$1.60 per case.

Prices cash with order, f. o. b. Cincinnati.

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Pearl and Walnut Streets. Cincinnati, Ohio.

This Letter Is For You

Dear Mr. Beekeeper:

We want to thank you for your patronage during the last season. We have had a fine year, and trust you have had the same. We have done our best to try and please you in every respect. Have filled most orders the day received, and have tried to carry out the real meaning of "SERVICE."

We are hoping to have your patronage next season, when we will endeavor to give even better SATISFACTION than heretofore.

Here's hoping for a fine Season next year.

Sincerely,

F. A. SALISBURY,
1631 *W. Genesee St.,*
Syracuse, New York.

HONEY MARKETS

U. S. Government Market Reports.

SHIPPING POINT INFORMATION (FIRST HALF OF SEPTEMBER.)

CALIFORNIA POINTS.—Demand is improving somewhat, altho prices show little change, and supplies of white honey are cleaning up rapidly. The crop yields up to Sept. 1 were much below average, being 38% of last year and about 60% of the average. The yield from alfalfa was very poor, and low production figures from the citrus and sage counties reveal a disappointing output there. Carloads f. o. b. usual terms at loading points, white orange blossom 10-11½c, light amber sage 7-8c, light amber alfalfa 5½-6c per lb., white sage 10-11c. Beeswax, demand light, market weak Growers receiving 20-22c per lb.

INTERMOUNTAIN REGION.—Shipments are increasing under an improved demand. A half crop in several of the more important producing areas is looked for. Northeastern Idaho, however, reports a good yield. Summer frosts in Utah, Nevada, and New Mexico, excessive rains in some areas, and widespread damage in many States by alfalfa weevils were largely responsible for the curtailed output. In the southern part of the region, prospects are good for a late nectar flow. In Colorado, Utah, Idaho, Nevada, and New Mexico, white alfalfa and sweet clover have been selling at 7-8½c per lb. in carlots, with less than carlots as high as 12c per lb. Large lot sales of light amber stock ranged 5-6c. No. 1 alfalfa comb is quoted $4.80-6.00 per 24-section case. In Arizona cotton and alfalfa mixed has sold at 5½-6c for white and 4¾-5c for amber. Production in this State was curtailed 20-25% by drought.

WASHINGTON.—Heavy losses of bees are reported in the Yakima fruit district from spray poisoning, thousands of colonies being weakened to nonproductiveness, and many killed out completely. American foul brood has been much in evidence. White extracted honey is quoted around 11c per lb.

TEXAS. — Notwithstanding severe summer droughts, a better than average crop has been gathered in Texas, as a result of early favoring conditions. The dry weather, however, has reduced chances for a good fall flow. Some bees are starving, but most colonies are in good condition. White extracted honey has averaged 8½c per lb. in large lots, with chunk quoted at 12½c per lb.

CENTRAL STATES.—Yields in the white clover belt have generally been above the average, especially in Michigan, Ohio, and Indiana. They are better than last year east of the Mississippi River, and poorer west of it. Commercial producers have on the whole had a good season. Prospects from clover for next year are not so encouraging, as rain is needed in large amounts to start the clover again, which has suffered severely from drought in much of the area. Recent rains have been sufficient in the eastern section to help the aster and other fall plants from which a good flow is expected. There has been an unusual amount of American foul brood in some sections, nearly wiping out the bees in several areas. Large lots of white clover are reported as bringing 7½-9½c per lb., altho some large beekeepers are holding for 10-12c per lb., and small lots rule considerably higher. Comb honey ranges $4.50-6.00 per 24-section case, depending on the quality and grade. There is little demand for beeswax, for which beekeepers are receiving 22-26c per lb. The Plains area continues very dry, with little on which the bees can work. Some feeding will have to be resorted to or many colonies will starve. There is little prospect for a fall flow. Large lots of honey are moving at 8-12c per lb.

NORTHEASTERN SECTION.—The long-continued drought checked early nectar flow, but goldenrod, buckwheat, and aster are now helping out the yield. In some sections the yield from goldenrod has been exceptionally good. Large lot prices for white honey range 8½-12c per lb.

SOUTHEASTERN SECTION. — The southern States were favored in the early part of the season, but later rain cut the crop of white tupelo in west Florida, and dryness reduced the sweet clover yield in Alabama. Goldenrod and Spanish needle should produce a satisfactory fall flow. In Florida some beekeepers are adding to their colonies as a result of surplus honey on hand and the poor market outlook. A few beekeepers in Florida are selling honey as low as 5-5½c per lb., while others are holding for 10c. Alabama, Louisiana, Mississippi, and Georgia apiaries are generally receiving 7-10c per lb. for extracted honey.

WEST INDIES.—Supplies in Porto Rico are said to be difficult to obtain. Cuban shippers recently quoted low as 4½c per lb. for refined honey, altho shipments aggregating 9 or 10 carloads were made to Europe a few weeks ago at 62c a gallon.

TELEGRAPHIC REPORTS FROM IMPORTANT MARKETS.

BOSTON.—No carlot arrival reported since last report. Old crop comb honey cleaning up slowly and no sales of new comb reported. Supplies of extracted honey light, particularly of Porto Rico, which is scarce, in good demand, and slightly higher. Comb: Sales to retailers, old crop New York, 24-section cases white clover No. 1 heavy $7.50-8.00. Extracted: Sales to bottlers and confectioners, Porto Rico, amber 85-90c per al. California, new crop white sage 14-16c per lb. Brokers less than carlot sales delivered Boston basis, California, new crop white sage 11½c, light amber alfalfa old crop 6½c per lb.

CHICAGO.—Arrivals since last report, 1 car Ohio, 1 car Colo., and approximately 2,000 lbs. Minn., 2,000 lbs. Calif., and 1,000 lbs. Ia. Demand and movement fair with markets just about holding even. Extracted: Sales to bottlers, per lb., Iowa, white clover 11-12c. Colorado and Arizona, white alfalfa 10c, light amber alfalfa 7½-8½c. California, mixed mountain flowers, white 9-10½c. Comb: Sales to retailers, 24-section cases Colorado, No. 1 alfalfa $6.00-6.50, No. 2 light weight, some broken sections $4.00-5.50. Beeswax: Receipts moderate. Market about steady with only fair movement. Sales to harnessmakers, ship supply houses, and insulator manufacturers, Arizona, Oklahoma, and Missouri, light 27-30c, dark 25-27c per lb.

CINCINNATI.—I car Colo. and 1 car. Calif. arrived since last report.

KANSAS CITY.—1 car Colo. arrived since last report. Supplies moderate. Demand and movement slow, market dull on both comb and extracted. Sales to jobbers, extracted: Colorado, white alfalfa 19-12c per lb. Comb: Colorado, 24-section cases No. 1 white $5.50-6.00.

MINNEAPOLIS.—Since last report 1 car Idaho comb arrived. Demand and movement light, market steady. Sales direct to retailers, comb: Idaho, new stock 24-section cases alfalfa and sweet clover No. 1, $7.00-7.50.

NEW YORK—Domestic l. c. l. receipts limited, foreign receipts light. Supplies limited. Demand limited, movement light, market slightly stronger. Extracted: Spot sales to jobbers, wholesalers, confectioners, bakers, and bottlers, domestic, per lb., Californias, white orange blossom 11-13c, white sweet clover 9-10c, light amber alfalfa 7½-8c. New York, white clover 9-10c, South American and West Indian, refined, per gal. best 65-70c, poorer low as 60c. Beeswax: Foreign receipts moderate. Supplies moderate. Demand moderate, movement limited, market steady. Spot sales to wholesalers, manufacturers, and drug trade, South American and West Indian, crude light wide range in prices, best 24-26c, poorer 22c, medium 17-18c, dark mostly 15c. African, dark 15-16c per lb.

PHILADELPHIA.—Arrivals since last report, 1 car Wyo., 15 bbls. Porto Rico, 21 bbls. southern and 125 cases N. Y. Supplies light and insufficient to meet demand. Demand good, market active, prices higher. Extracted: Sales to jobbers, bakers, and wholesale druggists, Porto Rico, mixed flavors light amber 73c per gal. Southern, amber in bbls., 71c per gal. Southern, in 60-lb. tins light amber 10½c, amber 9½c. Wyoming, white sweet clover and alfalfa in 5-gal. cans 10c per lb. Beeswax: Receipts light, demand slow, market steady. Sales to manufacturers, per lb. South American, crude light 25-26c, slightly darker 22-23c. African, dark 16-17c.

ST. LOUIS.—Comb: Practically no receipts of new stock reported. Supplies of old stock moderate. Demand is limited. Market has generally a slightly firmer tone but few sales reported and all

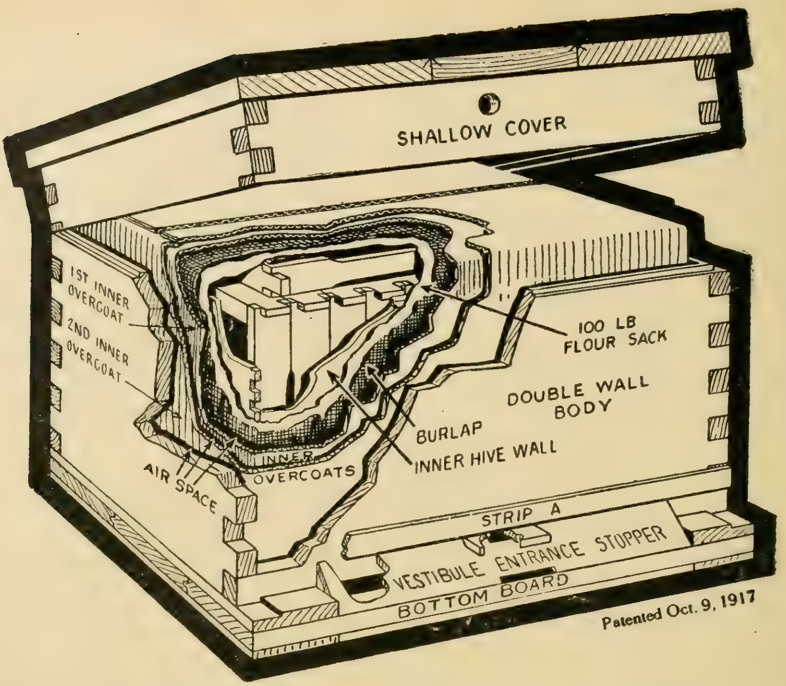
(Continued to page 660.)

Opinions of Producers.

Early in September we sent to actual honey producers and to some associations the following questions:

1. How does the total crop of surplus honey compare with normal to date in your locality? Give answer in per cent.
2. How much surplus honey per colony (if any) has been stored from the fall honey flow (since August 1) in your locality?
3. What is the condition of the colonies in your locality compared with normal as to (1) Number and age of bees? (2). Stores for winter? Give answer in per cent.
4. What is the condition of the honey plants for next season at this time compared with normal?
5. What price are producers receiving for the new crop at their station when sold to large buyers? (1) Comb honey? (2) Extracted honey?
6. What are prices to retailers in small lots? (1) Comb honey fancy or No. 1 per case? (2) Extracted honey in five-pound packages?

				Condition			*Wholesale*		*Retail*	
State.	*Reported by*	*Crop.*	*Fall Surp.*	*Bees.*	*Stores.*	*Plants.*	*Comb.*	*Extract.*	*Comb.*	*Extract.*
Alabama	W. D. Achord	80	0	100	100	100		$0.09		$0.85
Alabama	J. M. Cutts	40	0	100	125	80	$0.20		$4.80	.60
Arkansas	J. Johnson	150	12	100	100		.25		6.00	
California	L. L. Andrews	25	0	75	50	100		.10		
California	G. Larinan	20		100	100			.09		.75
California	M. H. Mendleson	10	0	100	100	100			7.20	.60
California	M. A. Saylor	75	50	100	100	100	4.00	.07	5.00	.75
Colorado	J. A. Green	95	10	100	100	100		.07	5.15	.60
Colorado	B. W. Hopper	20	5	80	80	100	5.50	.10	6.00	.75
Connecticut	A. Latham	100	10	100	100	90			6.00	1.25
Connecticut	A. W. Yates	30	0		90	60			.27	.55
Florida	C. C. Cook	100		100						.90
Florida	H. Hewitt	50	0	80	100	100		.07		.85
Florida	W. Lamkin	75	0	100	100	100		.09		.75
Georgia	J. J. Wilder	70	10	100	100	100	6.00	.10	.30	.75
Idaho	J. E. Miller	100		100	50	90	.20	.08	.40	1.75
Illinois	A. C. Baxter		60	100	100	100	.30	.20	.40	1.50
Illinois	C. F. Bender	70	20	100	100	100	6.00		7.00	
Illinois	A. L. Kildow	100	50	100	75	50			.25	1.00
Indiana	E. S. Miller	100	75	100	100	100			6.00	1.00
Indiana	T. C. Johnson	100	20	125	50	100			6.00	1.25
Indiana	J. Smith	50	0	100	100	100	.25	.20		
Iowa	E. G. Brown	55	0	100	100	75		.12	6.00	1.25
Iowa	F. Coverdale	0	0	110	70	65				
Iowa	W. S. Pangburn	15		95	75	90		.15		.90
Kansas	C. D. Mize	60	0	100	75	100			6.50	
Kansas	J. A. Nininger	100	0	100	90	90			6.00	1.00
Kentucky	P. C. Ward	30	20	100	100	100				
Louisiana	E. C. Davis	75		100	100	100	6.00	.09	6.50	1.00
Maine	O. B. Griffin	60	0	95	85	90	.30	.25	.33	1.50
Maryland	S. J. Crocker, Jr.	30	5	100	100	100			5.50	1.00
Mas'chusetts	O. M. Smith			100	50	75				
Michigan	I. D. Bartlett	75	30	125	100	100			6.00	.80
Michigan	L. S. Griggs	85	15	100	50	100				
Michigan	B. F. Kindig	100	50	100	125	125	.22	.12	7.25	.85
Michigan	F. Markham	100	25	100	100	100	.25		6.00	1.00
Michigan	E. D. Townsend			105	105	50		.14		
Minnesota	C. Blaker	33	10	90	90			.11	7.50	1.50
Mississippi	R. B. Willson	80	30	100	80		6.00	.09	.30	1.50
Missouri	J. H. Fisbeck	120	35	100	100	100				
Missouri	J. W. Romberger	20	0	75	75	50	5.50	.15	.32	.97
Montana	R. A. Bray	95	25	90	95	100	5.50	.14	6.00	.82
Nevada	T. V. Damon	50	40	100	85	60	4.00		6.00	.65
Nevada	E. G. Norton	20	0	100	100	100		.10		
Nevada	L. D. A. Pierce	0	0	100	85	90				
New Jersey	E. G. Carr	40		100	100					
New York	Adams & Myers	50		100	75	25	5.00	.09	6.50	1.00
New York	G. Howe			100	100					
New York	F. W. Lesser	80	10	100	100	75	5.10	.09		
New York	G. H. Rea	40	0	100	100	50			5.50	1.40
New York	O. J. Spohn	70	40	100	100	100				
No. Carolina	C. S. Bumgarner	75		100	90	100	.25	.15		
No. Carolina	W. J. Martin	40	20	100	100		.25	.11	.40	.27
Ohio	E. G. Baldwin	150	85	125	125	80		.08	6.75	1.00
Ohio	R. D. Hiatt	133	0	120	75	100			6.00	1.20
Ohio	F. Leininger	125		100	75	75	.20	.14	.25	1.00
Ohio	J. F. Moore	100	0	90	80	90		.11	5.00	.75
Oklahoma	J. Heuleisen	20	5	50						1.25
Oklahoma	C. F. Stiles	20		100	70	100				
Oregon	H. A. Scullen	60	0	100	100	100	7.00	.12		1.00
Pennsylvania	H. Beaver	100	40	90	100	60		.12	4.50	.75
Pennsylvania	D. C. Gilham	80	20	100		90			8.40	1.40
Rhode Island	A. C. Miller	0		100	100	100				
So. Carolina	E. S. Prevost	75	0	100	100				.35	
Tennessee	J. M. Buchanan	100	0	100	100	100		.25	7.20	1.35
Texas	T. A. Bowden	50	0	90	100	100				.80
Texas	J. N. Maves	60	0	70	80	40	.13	.10		.60
Texas	H. B. Parks	90				110	.12	.08		.65
Utah	M. A. Gill	120		100	100	110	4.50		5.00	.60
Virginia	T. C. Asher	30	0	80	60	75	.25	.22		1.25
W. Virginia	W. C. Griffith	100	0	100		75			.25	1.25
W. Virginia	T. K. Massie	5	0	90	65	95				
Washingotn	W. L. Cox	50	0	85	90	100	7.00	.12	8.00	.60
Washingotn	G. W. B. Saxton	100	0	100	105	100				.80
Washingotn	G. W. York	75	0	90	85	90		.10		1.15
Wisconsin	G. Dittmer	15	15	90	100					1.25
Wisconsin	N. E. France	25		100	100	100		.17		1.00
Wisconsin	E. Hassinger, Jr.	50	0	100	100	40		.12	6.00	.85
Wisconsin	H. F. Wilson	35	0	100	80	100	6.00	.13	7.00	1.25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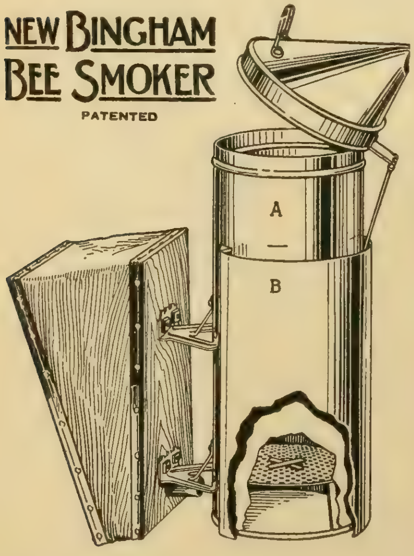
Winter Problem Solved by the Hive with an Inner Overcoat.

It will pay you to try out a sample shipment of these hives the coming winter. The outside walls are made of ⅞ material and will last a lifetime. Material and workmanship guaranteed to please you. The Inner Overcoats furnish the close-up protection which brings the bees through the winter in fine condition. We can make prompt shipment and prices have been reduced. Your order will have our prompt attention.


NEW BINGHAM BEE SMOKER
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BUY BINGHAM BEE SMOKERS.

On the market over 40 years. The bellows of best quality sheepskin is provided with a valve, which gives it pep and makes it respond quickly to the most delicate touch, giving as much or as little smoke as is required. The Big Smoke size, stove 4 x 10 inches, with asbestos-lined shield, permits the holding of the smoker between the knees without danger of burning the trousers or one's legs. This size is much appreciated by extensive operators.

SPECIAL SALE HONEY PACKAGES

Get our latest reduced prices on all honey packages. Let us add you to our large list of pleased customers on this line of merchandise. Special prices on shipments from factories direct to customer. Sixty-pound cans in bulk and in cases. Friction-top pails and cans all sizes. Clear flint glass, Mason jars pints and quarts, tumblers, pound jars and other sizes. Get on to our list, so as to get quotations.

A. G. WOODMAN COMPANY
Grand Rapids, Michigan.

Five-Pound and Ten-Pound Friction-Top Pails

We are naming prices below on these pails, and please note that **THESE PRICES ARE F. O. B. CARS LANSING**, and not from some distant factory point from which you will get slow delivery and high freight rates:

	25	50	100	200	500
5-lb. Friction-top pails......	$2.15	$4.10	$7.75	$15.25	$37.00
10-lb. Friction-top pails......	2.90	5.75	11.25	22.00	54.00

5-lb. pails per wooden case of 12, per case $1.35; ten cases 12.50
10-lb. pails per wooden case of 6, per case $1.05; ten cases 9.50

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Comb Honey Shipping Cases

There is an increasing interest in the production of Comb Honey, and a material reduction in price on the shipping cases. You will get better prices for your honey if put up in these attractive packages. We quote below:

	10	50	100
24-lb. four-row for 1⅞-in. sections......	$6.00	$29.00	$57.50
24-lb. four-row for 1½-in. sections......	5.85	28.35	56.00
24-lb. four-row for 4 x 5 sections........	5.85	28.35	56.00

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Paste for Tin and Glass Packages

We have a very excellent paste for fastening labels on your glassware or pails. THEY STICK. We are quoting prices below. Postage extra.

"A" grade paste, per pint..........................	$ .30
"A" grade paste, per quart..........................	.55
"A" grade paste, per gallon..........................	2.00

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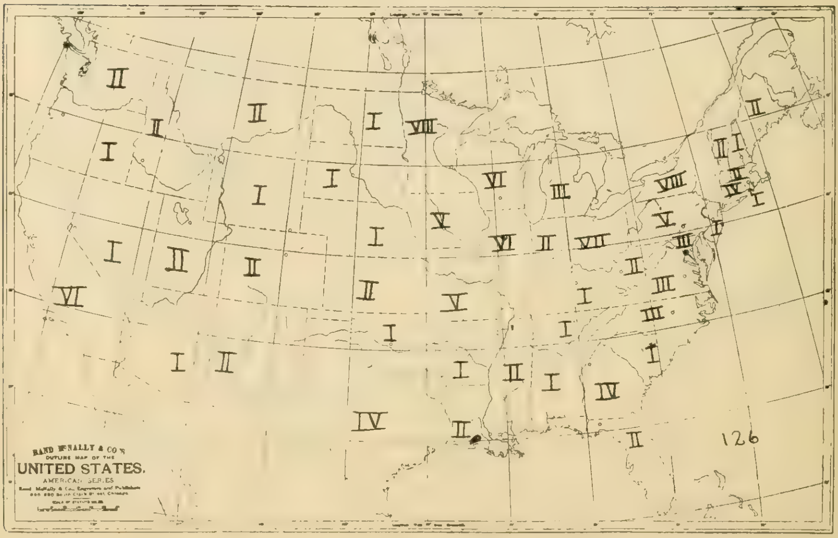
510 North Cedar Street, Lansing, Michigan

WE HAVE 126 COMPETITORS IN U. S. A.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126
RAND McNALLY & CO'S OUTLINE MAP OF THE UNITED STATES. AMERICAN SERIES

In May, 1921, 126 firms advertised beekeepers' supplies. They made and priced their products to get the business. Distributing nationally, we competed with all of them. Consider that of the 800,000 beekeepers in America, Over 80,000 were on the "Beeware" list in 1921.

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GLEANINGS IN BEE CULTURE

OCTOBER, 1921

Asking Retail Prices When Selling Locally.

PROBABLY more honey is being sold locally by beekeepers this season than ever before, the demand in some localities being quite brisk at this time. Those beekeepers who are selling their own honey should again be reminded that they should ask a fair price for the honey when selling it at retail. It is not necessary to cut prices below the market in order to sell a really good grade of honey. When the beekeeper sells his own honey he should remember that he as salesman is entitled to pay for his time in making sales and delivering the honey. The consumers expect to pay for this service.

* * *

The Doctor Miller Memorial Fund.

THOSE who have not already sent in their contribution to the Doctor Miller Memorial fund and who expect to do so, are urged to mail their contributions at their earliest convenience. The matter is being held open for a short time on account of contributions being sent in from beekeepers' associations, as the season for holding their meetings is here, as well as belated offerings from individuals. Subscriptions may be sent to any member of the committee as follows: C. P. Dadant, Hamilton, Ill.; B. F. Kindig, Lansing, Mich.; E. G. LeStourgeon, San Antonio, Tex.; Dr. E. F. Phillips, Bureau of Entomology, Washington, D. C.; E. R. Root, Medina, Ohio.

* * *

Excessive Brood-Rearing in September.

THE LATE honey flow has been unusually good, especially thruout the northeastern part of the United States and parts of Canada. In some localities considerable surplus honey has been stored since August 1, as will be noted in our "Opinions from Producers" on our market page. In other localities the bees have gathered but little more than they have consumed in brood-rearing, and in many places they have gathered only enough to stimulate heavy brood-rearing while using up their supply of stores. Many beekeepers report that their brood-chambers are filled with brood, having almost no honey.

It is not often that beekeepers complain of too much brood in September, the trouble usually being in having too little. As a rule, the bees are in excellent condition for winter, but where the fall honey flow has been light there is great danger that these splendid colonies of young bees will starve this winter if not fed. Many colonies that were well provided with stores in July have used most of their honey in brood-rearing and are now in danger of starvation. Feeding, if needed, should by all means be done this month in the northern States.

* * *

F. W. L. Sladen Accidentally Drowned.

OUR readers will be shocked to learn of the untimely death of F. W. L. Sladen, Dominion Apiarist, Department of Agriculture, Dominion of Canada. Professor Sladen was accidentally drowned on Sept. 10 at Duck Island, where he was carrying on special research work in the breeding of bees. Our readers will remember that a preliminary report of this work was published in this journal in the issue for February, 1920.

Several articles from his pen have appeared in our columns recently and others were in contemplation or preparation. The beekeeping industry has lost in Professor Sladen one of its most valuable men. He was devoting his entire time to research in beekeeping problems.

* * *

Fall Honey Flows Earlier in North.

STRANGE as it may seem at first thought, the fall honey flow begins earlier in the North than in the South. In many cases, even the same species of plant begins to yield nectar first in the far North, and the honey flow then moves southward, thus reversing the movement of the spring honey flow. In general, nectar secretion apparently begins in the South in the spring, moves northward as the season advances, then turns around, and moves back southward on the fall flowers. In some places in the far North the spring honey flow is so late and the fall honey so early that there is no interval between, while farther south the interval increases. This brings up the question whether the midsummer dearth of nectar is a result of higher temperature or a lack of flowers. For instance, could the gap in the honey flow be closed by carefully planned plantings of different varieties of sweet clover? Attempts were made years ago to to close this gap by early planting of buckwheat but without success. Usually plants blooming out of season furnish but little if any nectar.

* * *

October Best Time For Packing Bees.

OCTOBER is preeminently the month for packing bees for winter. In the far North the earlier in the month this is done the better. In fact, some northern beekeepers prefer to pack their bees late in September. As a rule, there is less rain during October than during other fall months, so that the work of packing is not often interrupted for long by bad weather, and the packing can be done while the hives and material are dry. If packing is postponed until later, rain or snow often interferes with the work and the hives may be wet or covered with snow. If nectar is gathered late or if feeding is necessary, the nectar or syrup is no doubt better ripened when the bees are packed. Thruout the North all winter packing and feeding, not aready done, should be done this month.

* * *

Shall We Eliminate the Word Extracted from Honey Labels?

A LARGE percentage of the honey labels used on bottles and cans of honey in this country contain the words "Extracted Honey," the word "Extracted" in some cases being almost as prominent as the word "Honey." This term has so long been established in beekeeping literature that it would not be wise at this time to attempt to eliminate it, even if it were desirable to do so. As a technical term for beekeepers perhaps no better could be found, but why confuse the public by printing a technical term in beekeeping on honey labels? To many people, "Extracted Honey" conveys the idea that the honey has been put thru some process. They think of process butter or lemon extract, and too often they associate "Extracted Honey" with manufactured food products. If they know how good "real honey" is, they may drive to the country to buy it from some beekeeper who sells the honey "just as the bees made it."

Instead of making capital of the fact that the consumer gets the honey just as the bees made it except that it is transferred from the waxen containers, built by the bees, into glass or tin containers for the market, beekeepers have been using a term on their honey labels which suggests that the honey has been changed by some special process. Why not eliminate this word from honey labels, simply using the word "Honey?" It is a good word to conjure with and any attempt to improve it with any qualifying word is liable to make it less attractive. Comb honey can then be differentiated by referring to it as "Honey in the Comb" or "Comb Honey."

* * *

Importance of the Quality of Winter Stores.

ELSEWHERE in this issue are discussions of the effect of the quality of the winter stores in the North where the bees are often confined to their hives for long periods without a cleansing flight. In cellar wintering success or failure hinges largely on this one factor; for, no matter how strong the colonies are in young bees or how well they are protected, successful wintering in cellars can not be accomplished on inferior stores. In the far North the same thing is true in outdoor wintering. Fortunately for the beekeepers in the far North the honey stored there is better for winter stores, as a rule, than that stored farther south, but it can not always be depended on as safe for the northern winters.

Last winter was so mild that the quality of the stores made but little, if any, difference in the way the bees wintered in the northern part of the United States, for they had frequent cleansing flights; but we need only to recall conditions during the previous winter for an example of the disaster which comes from a combination of a severe winter and poor stores, even as far south as Kentucky and Tennessee.

The question again comes up whether it will pay beekeepers to go to the trouble and expense of feeding to correct the quality of winter stores where they are not of the best, doing this year after year, in localities where perhaps only one winter in five or ten would bring disaster from inferior stores. How many business men, in order to save a little each year, would take a chance on their business being wiped out once in every five to ten years? Instead of taking such chances, business men pay out large sums annually in various kinds of insurance to protect themselves against a possible loss. Since beekeeping is rapidly becoming a serious business with many, such chances should no longer be taken.

In many cases at least when the stores are inferior, the beekeeper actually profits by feeding 10 to 15 pounds of good stores after brood-rearing has ceased, even during the milder winters, because the bees consume less of good stores than they do of poor stores. This is because the bees are more active when they use poor winter stores. The actual consumption of stores during the broodless period is sometimes two or three times as many pounds when the stores are poor as when they are good, while in the spring the poor stores probably go as far in brood-rearing as the good stores. In the northern half of the United States we may find that feeding to correct the quality of the winter stores actually pays year after year in the saving of stores alone, to say nothing about saving the vitality of the bees by enabling them to remain more quiescent during the broodless period. As mentioned elsewhere, some beekeepers now do this kind of feeding by placing combs of early-gathered honey of good quality below the brood-chamber after most of the brood has emerged, so the bees will move up some of the honey, while others prefer to feed 10 to 15 pounds of a heavy sugar syrup. In either case the important thing is to have it stored where the brood has recently emerged, so it will be used first.

* * *

Honey Deserves To Be Better Known.

IN SPITE of all the publicity given to honey in this country during the past decade, apparently but a small percentage of the American people give it more than a passing thought, and this only on rare occasions. At one time this was also true of raisins, oranges, grapefruit, and many other well-known food products. Most housewives now know something about where and how these once obscure foods are produced. They know something about the process of manufacture of various breakfast foods and where the great factories are located that make them. They know more or less about dozens of articles to be found on the grocers' shelves entirely unknown to former generations; but how little they know about honey—one of the oldest of human foods!

How many people aside from beekeepers know that hundreds of intelligent men and women are devoting their time to the production of honey, some of whom ship their honey to market in carload lots? How many people know what plants furnish surplus honey, how the honey is taken from the bees and taken out of the combs? Most people, when their attention is called to the subject of honey and honey production, think of a few colonies of bees back in the garden of their childhood days, which on rare occasions yielded a meager supply of a most delicious and wholesome food. They do not know that an abundant supply of even better honey can now be purchased in almost any market at a reasonable price, or that several tons of it may be piled up in the honey-house of a local beekeeper a few miles away waiting for a purchaser.

If more people could know even a few facts about bees, honey production, and honey, it would certainly seem that sales of honey should take a jump that would startle all of us. Much good is being accomplished along this line just now by pushing the sale of honey by personal contact of beekeeper and consumer in selling honey locally, as well as thru the regular channels of trade. All of this is certain to result in a greater consumption of honey in this country, but we still have a long way to go before honey becomes sufficiently well known to occupy the place it so richly deserves among the nation's food products.

Beekeepers can do much toward making honey better known by furnishing carefully written and interesting articles on honey production and honey for their local newspapers. These papers are anxious to secure this kind of material for publication, consisting of well-written articles describing a local industry and not savoring of free advertising, especially if the editor or reporter can be induced to visit the apiary to see how honey is produced, and to learn how good it is by tasting liberal samples as it runs out of the extractor. Frequent mention of the honey industry should appear in our newspapers just as of other minor industries, and honey should be listed on the market page with other produce.

Beekeepers who have the gift of writing should supply their local papers with as much matter on honey production as they will use. These articles should be carefully written, interesting, and instructive. They should present only those phases of beekeeping which are of general interest, omitting the more technical phases of the subject. There is a great wealth of material for such articles in the community life of the honeybee and its usefulness to man, both as a producer of a most wholesome food and as the chief agent in the pollination of many plants, its value to horticulture and agriculture being many times the value of the honey produced.

Just now perhaps the greatest benefit to the industry will come by emphasizing honey. The nectar-bearing plants of the locality which furnish surplus honey should be mentioned and the fact that the honeybee is the only means by which this nectar can be collected in sufficient quantity for human food. The process of extracting the honey from the combs without injuring them is interesting to most people.

The important thing is to inform the public in some way that honey production is now an important industry, that honey of finer quality than ever before is now being produced in quantities that stagger the imagination, and that this honey can now be purchased almost anywhere at a reasonable price. For those who do not feel that they can put their ideas in shape for publication in their local papers, Gleanings is prepared to furnish suggestions or assistance. If you will send us a rough sketch of an article for your local paper, we will put it in shape for publication, or we will furnish suggestions in the form of an outline from which an article fitting local conditions may be written. For this service there will be no charge.

THE WINTERING PROBLEM

The Three Essentials for Successful Wintering. A Winter Case Costing Only a Few Cents for Material

By Geo. S. Demuth

IN spite of all that has been written on the subject, wintering still stands out as one of the big problems in beekeeping. Every year, winter takes its toll of colonies of bees in this country, often 10% and sometimes, in restricted areas, even 60% or more of the colonies. Even in the sunny South, winter losses are quite common, often being as heavy as in the far North.

In addition to the loss of colonies, sometimes a large percentage of those which survive the winter are so depleted that they can be of but little value in honey production the following season. How many industries could stand such losses and continue to exist? But there are beekeepers scattered thruout the country who not only winter practically all their colonies even during severe winters, but who succeed year after year in carrying them thru in good condition to build up for the harvest. What do these men do that others fail to do?

There are but a few factors essential to successful wintering. When these are present to a sufficient degree in the fall, good wintering should result even during severe winters. These factors are so well known that it seems unnecessary to enumerate them here. Since they are almost wholly within control of the beekeeper, winter losses and depletion of colonies are not necessary, provided the beekeeper is willing to pay the price of having the conditions right before winter begins.

The factors essential to good wintering are:

(1) Normal colonies of vigorous bees in the fall, most of which are young.

(2) An ample supply of food easily available thruout the winter. (In the North the winter stores must be of the best quality.)

(3) Protection that is adequate for the most severe winter that may come in the particular location.

What Constitutes a Normal Colony in October.

As pointed out in an editorial in the August issue of this journal, preparation for winter begins in August, so far as having the colonies in a normal condition in October is concerned. In many cases the first step in preparing the bees for winter is that of replacing old or otherwise inferior queens with young ones, doing this in time for the young queen to have at least six weeks, before brood-rearing is suspended for winter, to lay the eggs that produce the winter bees. In other cases the first step in preparation for winter is that of giving several combs of honey to colonies not already amply supplied at the middle of August, in order that the number of winter bees shall not be reduced because of a threatened famine. In other words, the first steps in preparing for winter pertain to brood-rearing during the six weeks just preceding the time that brood-rearing is usually suspended in the fall. This important brood-rearing period is usually the latter half of August and all of September in the North, and a little later farther south. If brood-rearing is normal in extent during this period, there should be plenty of young bees for winter. The beekeeper needs only to correct any condition which may prevent the bees carrying out their own program as to brood-rearing during this period, such as poor queens, lack of stores, or lack of room. The bees will usually do the rest.

Fortunately thruout large areas in the northeastern part of the United States a good fall honey flow has put the bees in splendid condition for winter, so far as the bees themselves are concerned. In some places late brood-rearing has been excessive, and the hives are now full of young bees, but in some cases they have almost no stores. In other localities there may be plenty of stores for winter, but not many young bees. The deficiency in stores can be corrected, but there is now no remedy for a lack of young bees. To this extent at least, it has already been determined how the bees will winter. Nothing that can be done now can entirely retrieve a situation lost last August.

There should be at least about three pounds of young bees in each colony now, in addition to the older ones, for that many (still young if they winter well) will be needed next spring at the beginning of the building-up period.

Amount of Stores Needed for Winter.

The second essential for good wintering is an ample supply of stores so arranged that it is within easy reach of the bees thruout the winter. Just how much is needed is a question on which beekeepers in different localities may never agree, but the mistake of leaving too little is certainly more common than leaving too much.

Strong colonies wintering perfectly in a northern bee-cellar may consume less than 10 pounds of honey during the four or four and a half months they are in the cellar. In fact, there are records of strong colonies consuming even less than five pounds while in the cellar, but after they are put outside their stores disappear rapidly. Colonies that are well protected outside will consume but little more than those in the cellar if they are quiet; but, if active, they may consume many times the above amounts. In the South where the bees are much more active during winter, the stores are consumed rapidly, and unless they are abundantly supplied there is great danger of starvation.

While under favorable conditions only 10 or 15 pounds may be needed for the actual broodless period, the colonies may need 30 pounds or more in addition for spring brood-rearing. In most cases this should all be in the hives in October. As many successful beekeepers express it, they do their spring feeding in the fall; then they know it is done in time.

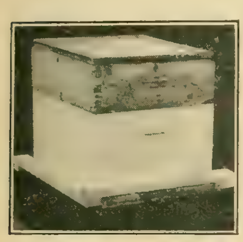


Fig. 1.—Two-inch rim in place about bottom of hive.

Empty Cells for the Winter Nest.

Much has been written about the necessity of vacant cells for the winter cluster, but it is well to remember that there is greater danger in having too many vacant cells than in having too few. For instance, good wintering could not be expected in a colony having 20 or 30 pounds of honey scattered thruout a two-story hive with but one or two pounds in each comb. When the bees are compelled to form a compact cluster it is safer for the cluster to envelop some of the honey on all sides and at the top than to be in contact with honey at the top only.

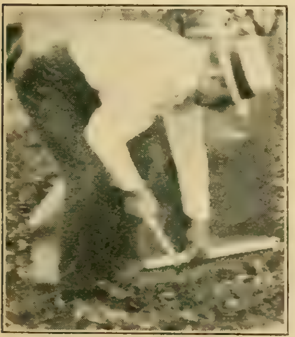


Fig. 2.—Paper is fastened to rim by means of lath.

As the years go by beekeepers are learning the great advantage of leaving more stores than were formerly thought necessary. Some now give each colony a shallow extracting super filled with early-gathered honey, while others give each colony six or eight full-depth combs of honey in an extra hive-body, wintering the bees in two stories. Still others accomplish similar results by using large brood-chambers, which they manage to have well provisioned with honey or sugar syrup in the fall.

Quality of Winter Stores.

In the South, where the bees can fly freely every week during the winter, the beekeeper needs only to see that each colony has enough stores to last until more can be gathered next spring, the quality of the stores making little if any difference. In fact, some California beekeepers extract all the white honey from the hives late in the summer, and then move to locations where the bees can fill the combs with honeydew for winter. Such a procedure would, of course, result in a 100% loss of colonies in the far North where the bees are confined to their hives without a cleansing flight for several months. Here it is fully as important that the winter stores be of good quality as that there shall be enough. In fact, it would seem less cruel, and at the same time less expensive, to take away all of their stores and let the bees starve in the fall than to leave them 50 pounds of honeydew or honey of such poor quality that the bees would burn out their lives and die miserably of dysentery in midwinter.

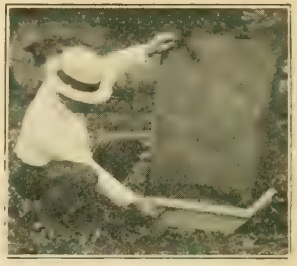


Fig. 3.—Cutting opening for entrance thru paper.

Between these two extremes where, during most winters, the bees enjoy a cleansing flight every two or three weeks, beekeepers, as a rule, are inclined to take their chances as to the quality of winter stores. Here the occasional severe winter works its greatest havoc, sometimes wiping out more than half of the colonies. It seems strange that thousands of beekeepers should continue to take the chance of losing heavily from poor winter stores when trouble from this source can be avoided so easily by feeding each colony 10 to 15 pounds of good honey or sugar syrup after brood-rearing has ceased. By waiting until most of the brood has emerged before feeding, the good stores are placed in the cells thus made vacant where they will be used first, leaving the poor stores until they may safely be used for brood-rearing next spring. Many northern beekeepers now insure themselves against loss from poor stores by practicing this kind of feeding annually in October, regardless of the amount of honey already in the hives. When sugar syrup is given it should be fed while still quite warm, and given in

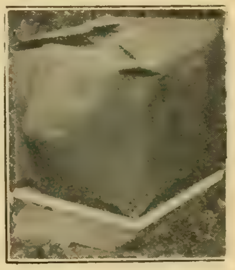


Fig. 4.—Upper edges of paper folded down.

such a manner that it will be taken down and stored quickly.

Some beekeepers, who use a separate ''food chamber,'' manage to have the combs in these filled with some of the best honey for winter, and then, after brood-rearing ceases, they put this super or ''food chamber'' below the brood-chamber. When this is done the bees soon carry some of this honey upstairs, storing it in the cells recently vacated by emerging brood. This is one way of feeding good honey, to correct the quality of the winter stores.

It usually happens that the poorest honey for winter use is stored last, being placed where it will be used first, leaving the good honey in the upper corners of the frames to be used the next spring. By late feeding this condition is reversed, as it should be. Honey from white clover, alsike clover, buckwheat (if not mixed with honey from other fall flowers), and alfalfa, if not granulated, is considered good for winter stores; but, when there is any doubt about the honey, granulated sugar syrup is the safest winter food for the broodless period in the North, leaving the honey for brood-rearing in the spring.

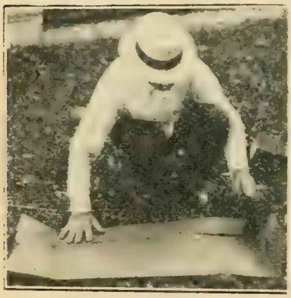


Fig. 5.—Creasing edges of cover before putting in place.

Winter Protection.

Colonies which have plenty of young bees in October and which are supplied with an abundance of stores of good quality, as described above, are hard to kill by severe weather. It might be better if they could not stand so much abuse; for, if they were less able to fight their way thru the winter, many beekeepers would be compelled to protect them better than they do now or quit trying to keep them.

In wintering outside, some prefer to have the packing built in as in double-walled hives; others prefer to use a winter case to hold one, two, or four colonies. Equally good results should be obtained by any of these types of winter packing, provided the protection is adequate, and almost any of them should pay back their first cost every year in increased profits from the apiary in the northern half of the United States. The four-colony winter case is rapidly gaining in favor among northern beekeepers.

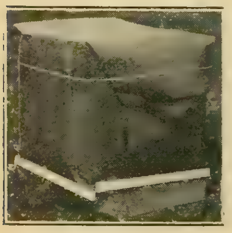


Fig. 6.—Cords are used to hold cover in place.

The first cost of winter cases need not stand in the way of good wintering, however, for bees can be well protected for only a few cents per colony for cost of material, by using a cheap grade of tarred paper to hold the packing in place and keep it dry.

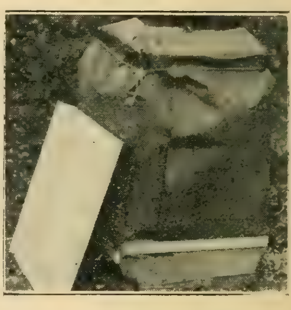


Fig. 7.—Arrangement for using regular hive cover.

An Inexpensive Winter Case Made of Paper.

To pack a single colony in a regular 10-frame hive, cut two pieces ⅞ x 2 x 20¼ inches, two pieces ⅞ x 2 x 24 inches, two pieces lath 20 inches long and two pieces 24 inches long. From a roll of 36-inch single ply slaters' felt, cut one piece 8 feet long and another 4 feet long.

Make a rim of the 2-inch pieces which fits around the lower part of the hive (Fig. 1), by lapping over the corners and fastening with a single nail. The piece in front should rest on the side rails of the bottom-board, leaving the entrance open. The two side pieces should come below the end piece in front and above the end piece at the back, thus dropping the rim ⅞ inch lower on the sides than in front, and ⅞ inch lower at the back than on the sides. A small nail driven part way into the back end of the bottom-board supports the rim at the back.

Stand the 8-foot strip of paper on edge around the hive and tack on the lath to fasten the paper to the rim, using two nails in each lath driven only part way home (Fig. 2). The paper should touch the ground all around the hive, the entrance now being covered with the paper. Cut a hole ⅜ x 2 inches thru the paper for an entrance (Fig. 3). This hole can easily be enlarged next spring when a larger entrance will be needed. Where the ends overlap, pin the paper together with two or three wire nails.

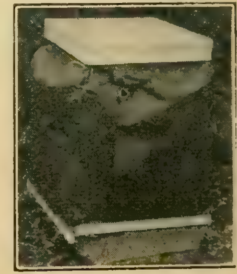


Fig. 8.—Regular hive cover in place.

The packing material should be packed down in the corners to make them stand out square, after which the packing is simply poured in at the sides and ends without pressing down. This is to prevent bulging out the sides. From three to six inches of packing can be put in at the sides and ends by permitting a slight bulging of the paper beyond the rim at the bottom, or a greater amount can be put in if some slack is left in the paper at the lower corners when the lath are nailed on. Fill in with 8 to 10 inches on top, then fold down the upper edges of the paper as in wrapping a package (Fig. 4).

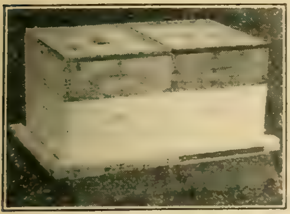


Fig. 9.—Rim in place for packing hives in pairs.

Crease the 4-foot piece of paper, which is to be used for the cover, by folding over the edges (Fig. 5) before putting it in place. After it is in place fold the corners neatly, as in wrapping a package; then tie a cord around the folded-down edges to hold them snug against the sides (Fig. 6). Tie a cord to one of the projecting nails in one of the side lath, pass it across the top of the hive under both nails on the opposite side, then back to the other nail on the first side, where it is fastened.

Using Regular Hive Cover Instead of Paper Cover.

The ordinary hive cover may be used instead of the paper cover, by putting an empty hive-body on top of the hive, then folding the paper against its upper edge above the packing (Fig. 7). Tie a cord around the upper edge of the paper to hold it in place, pack the upper story, and put on the cover (Fig. 8).

Packing Hives in Pairs.

Hives can be packed in pairs with but little more material and labor for the two than for a single hive. For two colonies the 2-inch pieces for the front and back of the rim should be 36½ inches long (Fig. 9), and the lath for the front and back should be 36 inches long. The paper to form the sides should be cut about 10½ feet long (Fig. 10), and for the cover about 4½ feet long.

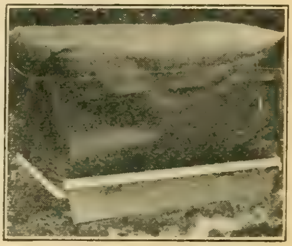


Fig. 10.—Pair of hives packed complete.

SOME PACKING CASE PROBLEMS

How These Difficulties Were Overcome to Meet the Necessities of a Large Producer

By E. G. Baldwin

THE underlying principles of good winter packing are universal, and need no rehearsing here. It is in their application that differences occur. From the time when the quadruple case first made its way into favor with beemen, down to the latest bulletin on winter packing, issued by the United States Department of Agriculture (September, 1918), it has suffered many and wide variations in details of construction. But, taking the variously made cases as they appeared, it seems to me that four cardinal weaknesses in the make-up have made the mechanical features of a case, otherwise really good, liable to just criticism. The points so censurable are as follows:

(1) The absence of any tried, tested, and approved device for enlarging or contracting the entrances of the case.

(2) Awkward, inadequate, or flimsy means of holding the corners of the case together.

(3) The laying on of the boards horizontally.

(4) Lack of rigidity in construction.

The case here described and illustrated remedies in some degree at least, so it seems to me, all four of the inherent weaknesses or faults named.

The recommendation for standard-sized entrances, as given in Farmers' Bulletin 1012, United States Department of Agriculture, is four augur holes, each three-eighths of an inch in diameter. And this size of opening I myself religiously preached from one end of Michigan to the uttermost parts of Ohio, and up and down the good State of Indiana. This, too, despite many complaints that kept coming in, that a larger opening must be provided in middle and southern Indiana, and in Ohio south of Columbus. When I took up the practical application of beekeeping principles commercially, more especially of the principles of winter packing in northeastern Ohio, several years ago, in a section where fall flows from buckwheat, goldenrod, and wild asters give an almost certain crop, that leaves the colonies overflowing with bees at the time they are packed for winter, I found it impossible to confine the bees to the hives by ''four three-eighths inch augur holes'' when first packed. The bees would cluster out in immense bunches all night and all day, sometimes for several weeks after packing, and work in the fields seemed almost to be at a standstill under such conditions. Again, in spring, when a heavy fruit bloom is on, or even soon after maples and willows ceased blooming, the clustering bees at the entrances of the cases caused much confusion and the loss of hundreds of little pellets of pollen, scraped off by the bees crowding at the openings.

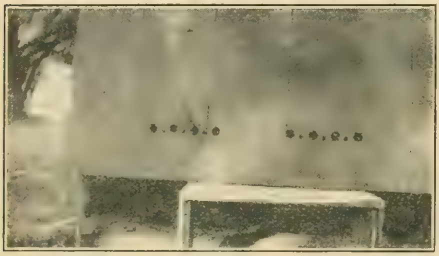


Fig. 1.—Shows the four ⅞-inch entrance holes for flight openings in early fall and late spring open, and the three ⅜-inch holes between the larger holes for use during cold weather. The larger holes are plugged during winter.

After trying a block that turned down at right angles in front of the augur holes, we discarded this form also as inexpedient, because any roughness of the outside wood of the packing case, or any unevenness in its surface would prevent a tight fit, allowing currents of air to draw into the augur holes. Such buttons also draw away from the case by warping, and make larger gaps than should be there. And so finally we tried out a simple plug, or set of plugs, inserted in the larger holes in cold weather. We bored four ⅞-inch holes for the flight openings in early fall and late spring, and between these we made three ⅜-inch holes (Fig. 1), to be used in cold weather. Of course, the small holes do no harm during the time the large holes are operating. The plugs we turned out on a stake-sharpening machine very easily and quickly. All the holes are lined up along the lower edge, to connect with the floor of the runway. The large holes are about an inch apart, but the distance apart is not a very material consideration.

Fastening the Corners.

A common recommendation for corner fastenings was ordinary screen-door hooks and eyelets. Such often pull out and are not very substantial. We found the eyelets or hooks themselves got jammed or knocked off in handling, loading, and hauling the cases ''knocked down.'' We then tried 2 x 2's upright along each end and side, with bolts thru both the 2 x 2's and the boards of the case; one bolt at the top, and one at the bottom of each corner—8 bolts in all, just as there were 8 hooks in all. We object to the boards running horizontally, for reasons to be given later; and the use of bolts necessitates this construction. Both bolts and hooks alike necessitated digging down inside the packing-case to open; and one trial of unpacking, by standing on my head and burrowing like a rat terrier in the sawdust was enough.

How simple the remedy for both faults! A simple change of the position of the 2 x 2's from upright to horizontal enabled us to run the boards of the case perpendicularly, and brought all four corners of the 2 x 2 cleats one above the other, so that a single rod can pierce and hold all the corners firmly and effectually, and, best of all, a mere lifting-out of the iron rod at two corners of the same end or side let the end or the side of the case open out and down most easily—no burrowing till one's face grows red and his fingers black.

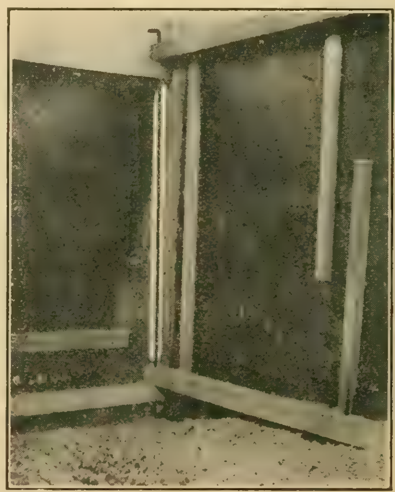


Fig. 2.—Corner construction. Note that the 2 x 2 inch pieces on the side overlap those on the end and are fastened by an iron rod which passes thru all four pieces.

Fig 2. gives an idea of the corner construction and the use of a 5/16 iron rod as a pin thru both top and bottom cleats of each corner. The upper end of the rod is bent at right angles for about an inch. The lower end is pointed. Notice that the 2 x 2 cleats are nailed on the side pieces of the case two inches higher than they are on the end pieces—which permits the ends and sides to come together unobstructed and allows each end of every 2 x 2 cleat to act as a stop against which the boards of the adjoining end or side come flush. Fig. 2 also shows, faintly, the one-inch strip nailed on the end piece of the case which comes flush against the side piece to serve as a weather strip against rain or snow. The iron rod inserted in the holes is far enough away from the boards to allow the weather strip a place behind it. Wonderful rigidity and solidity of the case are thus attained very simply.

The entire inner surface of the case is covered with building-paper fastened on with lath. This is to prevent the fine sawdust from absorbing a bit of dampness, even from the atmosphere. Sawdust (fine sawdust especially), such as we desire and use, is the ideal packing material; but, as everybody knows, it is most prone to absorb moisture if there is any within a hundred miles or less; hence our precaution in regard to building-paper.

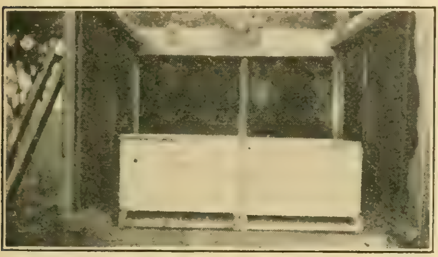


Fig. 3.—One end of case removed showing hives in place. Note how sides are supported by the 2 x 2-inch pieces which support the hives.

Our experience with cleats of ⅞ stuff for the framework has been unsatisfactory. The end or side pieces often bulge out in the middle when the packing is tramped down tight. Planer shavings in particular required to be rammed down very firmly between the sides and the ends of the hives and the case; and such pressure often strains the cases not held by more than ⅞-thick cleats at the top and bottom. Two 2 x 2 cleats, made of pine, are not heavy but they are extremely firm and rigid. The lower cleat on the side pieces of the case is nailed at the proper height from the lower edge, to permit it to rest on top of the 2 x 4's used for hive-supports (Fig. 3), thus forming a support for the side pieces which telescope down over the bottom of the winter case.

Advantages of Perpendicular Siding.

During the recent war it was practically impossible in most localities to secure lumber dry enough not to check and shrink when exposed to drying weather. Cracks often formed in packing-cases built of such materials, and leaking resulted when the boards ran horizontally; and even since the ''dove of peace'' has flown all over the lands, and old-time conditions are returning, it is still hard enough to get well-dried lumber. The difficulty here named forced us to resort to the use of perpendicular boards in making cases, and with the most complete satisfaction, for considerable checking can occur and still the case remains absolutely water-proof. Water will follow down a crack and run off at the bottom; but it will stop and run into the case if the same-sized cracks run horizontally. The sawdust in our cases has remained bone-dry up to the present time, and that, too, when the cases stand out in the open, winter and summer.

Rigidity of the Case.

Enough has already been said here about the firmness of this case. Not only will it stand handling, packing, and unpacking, but it goes together with a perfect fit—an item of no mean importance when the time of assembling is charged against the operation.

We use the regulation six-inch telescoping cover topped with tarred paper that is nailed well down over the boards on the ends and sides of the cover. The sides and ends of the case in turn telescope down over the bottom of the case.

Our runways (Fig. 4) are made of ⅞ stuff for strength and durability, with the customary division cleat in the middle, to separate the two hive-entrances. They run the full width of the hive entrances. Most of our packing material consists of fine planer shavings mixed with about an equal volume of fine dry pine sawdust—a combination that ''likes us well.'' We sack up all the packing material when the bees are unpacked in the spring, and the filled sacks are set in the cases ready for fall use. It is thus a very easy operation to set out sacks, set in hives, put in packing, and close the cases. The sacks are then tied up in bundles of 25 each, and carefully put away. We used to lay them in the cases on top of the packing; but an occasional predatory mouse, that does now and then get in, chewed so many holes in our precious gunny sacks that we now take more care to guard them from rodents. We pack six to seven inches around the hives, and our cases are high enough to allow 12 or 14 inches of packing above even a two-story hive, and 24 inches above a one-story hive.

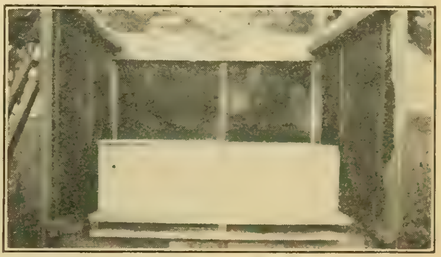


Fig. 4.—Entrance tunnel in position. This tunnel is ⅞ inch deep to correspond with the ⅞ inch augur holes opening to the outside.

Ashtabula, O.

PROF. H. D. HUGHES

Something More About the Man Who Has Done and Is Still Doing so Much for Bee Culture and Agriculture

By E. R. Root

THE name of Luther Burbank, the plant wizard of California, is known all around the world; but in these latter days we have a new wizard in the person of our sketch, Prof. H. D. Hughes, head of the farm crops department of Iowa Agricultural College. He has not simply made two blades of grass grow where only one grew before, but has made many of them develop and perform wonders. If he had done no more than to discover this new annual sweet clover, or Hubam, as it is now called, he would have been famous; but he has made some other discoveries in the line of new and better plants that will make him one of the really great world benefactors. We can not compare Burbank and Hughes, because they have exploited different fields.

One can not be in contact with this remarkable man without realizing that he is in the presence of genius itself. In spite of the great discoveries that have been laid to his credit, he has a transparent geniality that makes it easy for one to see the real heart of the man. The picture shows him as he really is—his delightful personality, the geniality of Douglas Fairbanks and the genius of Luther Burbank.

In addition to his great achievement, the discovery of the new Hubam clover described in our last issue, which is one of the greatest discoveries known in agriculture and bee culture, too, he has done some other things that deserve something more than a mere passing reference in a bee journal. Briefly I will attempt to enumerate a few things that I have been able to obtain from his friends and colleagues, for he is extremely reticent about his own exploits. Instead of saying, "*I* have done so and so," he will say, "It has been developed at the Iowa Agricultural College," as if he were not a factor in the thing. While beekeepers are not supposed to be particularly interested in corn and in growing it, they ought to be interested in a honey plant that will restore the old and overcropped corn lands thruout the South and West. This means that farmers with worn-out lime lands will propagate the plant, and the beekeepers will get the benefit. The time has now come when the needed plant food which has been taken off for so many years will have to be put back, and Hubam will do the trick.

Prof. H. D. Hughes and his characteristic smile.

There are eleven achievements that his associates place to his credit. Let us review briefly some of these:

(1) During the Great War, when seed corn was scarce, Prof. Hughes worked out the Ragdoll seed-corn germinator. This device is now recognized as the best method for testing individual ears. So useful is it that it is now being introduced all over the country.

(2) Prof. Hughes does not claim to be the discoverer of a new corn; but he took a new variety, the Silver King, and bred it systematically for five years, improved it, and then distributed hundreds of samples to farmers. Today Silver King is grown in Iowa more than any other strain.

(3) In 1903 he undertook co-operative experiments with farmers to determine why alfalfa was not grown more extensively in Iowa. He found the cause, i. e., lack of inoculation and lack of lime on a land supposed to have enough. This work encouraged the promoters of alfalfa in other States, and helped to establish alfalfa as a standard corn-belt crop.

(4) Prof. Hughes improved a method for preventing rust on oats; and after three years of work he was able to reduce the labor involved, by which the seed required per acre could be treated in only four minutes.

(5) The Ames hulling and scarifying machine was an invention of Prof. Hughes that took him about eight years to develop. It is one of his great

contributions to the world. Clover seed, which gave a germination of less than 25 per cent, after being treated with this machine will give a germination of over 85 and 95 per cent. Prof. Hughes could have patented this machine. He could have formed a stock company with himself as president and manager; but he preferred to give the whole thing to the public, as he did the new Hubam clover, without a cent of compensation other than what he received in his regular salary as head of the farm crop department of the Iowa State College.

(6) The Ames seed-sampler, sometimes known as the Hughes pneumatic sampler, is another one of Prof. Hughes' ingenious contrivances. By the use of this device, employing suction, samples of seed are cleaned automatically, more accurately, and much more quickly, than they could be treated by the old method. This invention, like his other ideas, was given freely to the public.

Experimental beds in the background where Mr. Crites is testing out the various strains of Hubam as well as those of the biennial sweet clover. It was easy to see that there was a wide variation, some showing three times the growth of others. This only emphasizes that one buying seeds should obtain his supply from a reputable grower. The main Hubam field, Iowa strain, shown on the left.

(7) In 1917, when the corn crop of his State did not mature, and much of it spoiled in the crib after husking, he developed a plan for crib drying that enabled the farmers to save thousands of bushels of corn that otherwise would have been spoiled. This invention helped to feed a world torn by the ravages of war. This, likewise, was given freely to the world.

(8, 9) Prof. Hughes has discovered a new grass which he believes is far superior to timothy, orchard grass, or blue grass. He also has it in mind to develop, on the side, a new hybrid corn which gives unusual promise. From neither of these will a single pound of seed be sold. Like all his other contributions, both of these will be given freely to the world.

(10) Prof. Hughes and I were strolling over a patch of the Black Belt just south of Montgomery, Ala. I noticed him pulling up a yellow sweet clover (*M. officinalis*). His eyes began to show that he had something that interested him.

"What have you found?" I asked.

"I think I have found an annual-blooming biennial sweet clover," he replied.

"Let's call it Alahu," I said.

"No," he said, "you helped to discover it, and it should be named for you."

I could have gone over that field a thousand times and not have seen it. I therefore declined the honor. I relate this incident to show that he is more than generous. It may be a valuable find. At all events, he saved the seed.

(11) His discovery of the new Hubam clover has already been exploited in these columns. After his discovery of this wonderful plant he might have kept his secret for a year or two, developing quantities of seed, and sold it at fabulous prices; but, no. He gave the discovery and the seed freely to the world. Apparently the pleasure of benefiting farmers, and beekeepers, too, means a thousand times more to him than the mere gathering together of a great mass of dollars.

After I had talked with him, slept with him, and eaten with him, I came to the conclusion that if there was any one characteristic that was more dominant in his make-up than any other it was that of benevolence—not in the sense that we ordinarily understand—namely, giving dollars—but in showing and helping his fellow man how to make them. It is that kind of benevolence that makes men who are useful to the world—not dependents.

I am glad to say that Prof. Hughes is one of the finest Christian gentlemen I ever met. He believes in the Sermon on the Mount absolutely, and he preaches it, not by words, but by acts. He has sown, and others are reaping.

The New Hubam in Ohio.

During the past few days it has been my

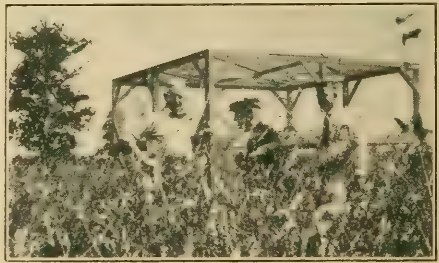
pleasure to visit W. L. Crites, president and manager of the DeGraff Food Co., DeGraff, O. He is another of God's noblemen. He is one of the few who, at the very beginning, fully appreciated the possibilities of Prof. Hughes' discovery of the new clover. He was not long in getting in touch with the Henry Field Seed Co., at Shenandoah, Iowa, who had raised quite a quantity of seed from a small package sent out by Prof. Hughes. This company raised so much that they were afraid they would not be able to sell all of it. Mr. Crites, having supreme faith in the new acquisition, made arrangements by which he bought half the seed at a price that would stagger men of less faith. When the Field Seed Co. disposed of their half of the seed, before Christmas he sold back to them a part of his stock and sowed the rest. His company has now nearly 400 acres in and around DeGraff, O., under cultivation. While the crop did not ''pan out'' quite as he expected, he and his associates have some fields as pretty as any I have seen anywhere.

W. L. Crites and A. I. Root standing beside a vigorous growth of Hubam clover at DeGraff.

Early and late Hubam in rows side by side. Mr. Crites has his right hand on the former and the left on the latter. It will be observed that the late strain has two or three times as much actual fodder or humus as the early. The early variety matured so quickly that it goes to seed with a growth on the average of one-third of the late Hubam. This only emphasizes the fact that for northern growers the late variety is much to be preferred.

Mr. Crites was originally a soil specialist. He had some beautiful black lime land, and was not slow in getting seed in the ground. He put out about 500 acres in Ohio, about 500 in North Dakota, and another hundred in Texas. He has gone at this whole proposition scientifically in that he has one of the most extensive seed-testing beds I have ever seen. He secured seed from various sources, and is now testing them in these beds. He finds some very wide variations. Some selections breed true to the characteristics of the parent plants, while others do not. In his opinion the Iowa strain, as discovered by Prof. Hughes and which he is growing in his large fields, is a better one for the northern farmer than the majority of other strains. It is medium late, bushy, and leafy, making a much larger amount of humus or fodder than the early strains. Mr. Crites showed me side by side an early annual sweet clover and a late annual. The plants of the latter were two or three times as large. The trouble with the early strains for the North, said Mr. Crites, is that it matures so quickly and then goes to seed before the plant can attain any size.

Hubam on each side with biennial white sweet clover in the center—all planted at the same time. It will be noted that the Hubam on the right is larger than the Hubam on the left, illustrating the point that there is a variation between strains. The old biennial is very much behind either. A. I. Root is walking down the row.



One of the cages that Mr. Crites has scattered in the various fields of Hubam to test out the value of bees for pollinating the clover. It is a little early yet to determine just what is the gain from having bees, but it is evident that the Hubam under the cage will not yield near as much seed as that on which the bees can work. Most of the bloom under the cage had not set seed, while that outside, of the same age, had gone to seed.

He has wire-cloth cages scattered thru the mammoth fields of the annual sweet clover. The mesh of the wire is just small enough to exclude bees but not small insects. So far the tests indicate that the plants available to the bees give from 20 to 30 per cent more seed. He has promised to give us the result in actual figures when the season closes.

The Biennial Versus the Annual Sweet Clover.

While in most cases the new annual clover is much superior to the biennial, there are cases when the latter is better than the former. The biennial springs up the first season, and blooms to only a very limited extent, then dies down, but leaves its root, which, however, lives over winter. The following spring it will produce another stalk that will grow very vigorously. For an early spring crop the biennial, on account of its large root from the previous fall and summer, has the advantage, but it takes nearly two seasons to get it. The average farmer wants something he can get in one year. It is here that the annual has the biennial beaten a mile.

In the test beds are several heads of Hubam that are covered with mosquito netting. This is to prevent cross-pollination and develop a seed true to type. The heads are then rubbed together inside the bag between the palms of the hands, thus bringing about self-pollination.

The biennial and annual in the same locality can be so planted that one will succeed the other in blooming. The biennial, after the second year, will ordinarily come first; and as it begins to die down, the annual with the later bloom will come next, making a continuous flow of honey till heavy frosts come on.

Our readers will remember that we sent 200 colonies to DeGraff, O., and planted them right in the midst of 400 acres of Hubam. A few days ago I drove over to see how the bees were doing. Perhaps the most pleased person present was A. I. Root himself, who was with me when we looked into the hives. When sent down they were only three and five frame nuclei; but at the time of our visit the queens and the bees had brood in six and seven frames. At the end of two or three weeks, at the present rate, when this brood emerges, the hives will be fairly boiling over with bees. No surplus has been secured thus far, for the very good reason that the honey has gone into brood. The plants will be in bloom till heavy frost. Had we sent our strong colonies down there, doubtless there would have been a large showing in honey. As it is, we call our experiment with bees and Hubam an unqualified success.

The Hubam, where it can be grown, will furnish fine fall pasturage. Real honey in the hives will be much better than sugar syrup for winter.

Hubam at Medina.

We planted biennial and annual in the same fields at Medina on the 17th of last June. The annual is now, Sept. 6, waist high, while the biennial is hardly above one's shoe tops. Some of the annuals are now six feet tall.

The bees are very busy on the annual, working from early morning till almost dark. The land was plowed and harrowed in the usual way; and to give the new clover every possible chance about two tons of lime to the acre was harrowed in. It was put in with an onion seed hand-planter, rows 36 inches apart. Some recommend having rows 40 inches apart so that the ordinary farm machinery doesn't have to be changed.

Complaint has been made that the seed is so expensive. We put in about one pound of seed to the acre on half of the patch, and on the other half double and treble that amount. One pound to the acre makes the best showing with us. As seed can be bought in quantity at $2.00 a pound, that much money to the acre is not expensive.

There was some doubt at the time we planted it whether it would mature in time to give a seed crop. Unless we have a very severe early frost we shall get a part of a crop if not a full one.

Caution.

It is probably fair to say that Hubam, or, for that matter, any sweet clover, can not be grown profitably everywhere. It can grow where any clover can be grown. There should be some lime in the soil—the more the better, and it should not be too wet. If the soil has not previously grown sweet clover or alfalfa, the seed should be inoculated. Your experiment station will tell you how to do this.

BEEKEEPING IN FOREIGN LANDS

Possibilities and Difficulties of Beekeeping in Mexico

By J. De Boer

THE Republic of Mexico is, without doubt, one of the most picturesque countries of the world on account of its scenery and luxuriant vegetation. Here we have all grades of climates—the tropical of the coasts, the temperate of the "Mesa Central" or central tableland, and the cold of the mountainous districts. The climate of the central tableland is delightful all the year around. Is it a wonder that our favorite insect, the honeybee, is doing well in this privileged country?

There is here a great variety of bees. The strain that abounds is the common black bee, which was imported by the Spaniards in the eighteenth century. This bee has multiplied itself to such an extent that it can now be found in every corner of the Republic. A great number of Indian farmers keep a few colonies in their back yards, usually not more than 10.

The Italian bee has also been imported in the last 10 years, but it is very difficult to keep the race pure because of so many black drones. A cross between the Italian and the black bee makes a very strong diligent bee, which can better stand the sudden changes in climate of the high tablelands where the days are hot and the nights sometimes quite chilly. However, most of the beekeepers prefer the pure-bred Italian because it is more gentle and therefore easier to handle.

Native Bees.

There are in Mexico several kinds of native bees. The only native bee of any practical value, however, is the stingless one which belongs to the genus "Melipona." I encountered on my trips thru the country two species of this bee. The Melipona I found in the State of Guerrero was of a dark-yellow color, while the other species of Tabasco and Yucatan was of a gray color with five very narrow bands on the abdomen. Both species live in the hollows of forest trees. The natives cut these trees under and above the place where the swarm is, take the log home, and hang it up by ropes outside, under the roofs of their houses. The honey crop is very limited because these bees seldom gather more than from eight to sixteen pounds a year. The wax is very dark and is known in Mexico under the name of "Campeche wax." The natives use it generally as glue with which they stick their advertisements on windows and walls. I once saw candles made from this wax.

The colonies are not very strong, and I never saw one with more than from 5,000 to 10,000 bees. The worker of the Melipona is smaller than the common honeybee worker. Her body is similar to that of the bumblebee and she stores the honey and also the pollen in egg-shaped cells. She makes the brood-combs horizontal instead of vertical and builds them one above the other. Each comb stands on a certain number of feet just long enough to permit the bees and the queen to walk between them. The cells are smaller than those of the common honeybee and at the first sight appear to be hexagonal, but on looking at the cells on the outside of the comb you see that they are cylindric. The combs are similar to those the wasp builds because they have cells on only one side. The Melipona fills three-fourths of the cells with jelly as soon as the cells are ready. Then the queen lays an egg on the surface of the jelly, and the cell is capped over with a very thin layer of wax.

The bees build their stores of honey and pollen on all sides of the brood cells. These cells for stores have the size and form of a pigeon egg. The honey is very thin and has sometimes a strong resin taste. However, I found Melipona honey in the State of Tabasco which could compete with the best-known honey. The pollen is sometimes eaten by the natives but has laxative properties.

The queen has not the grace of the common honeybee queen, because her swollen abdomen gives her the appearance of a spider. The swarm can raise another queen from the brood when the queen is lost by some accident.

Honey Flows and Honey Plants.

The honeybees in this country work almost the whole year round, because they are always able to find some honey in the field. Of course, I am speaking about central and south Mexico because in the north conditions are about the same as those in the southern parts of the United States. However, a regular colony in the coldest zone seldom consumes more than 10 pounds of honey in the winter time, and in semi-tropical and tropical zones they don't even touch their winter stores. There is only one honey crop in the colder climate in the months of September and October, and two or more in places lower than 5,000 feet above sea level. Honey flowers are so numerous that it would take too much time and space to mention them all. Those who want to know more about Mexican honey flowers can find details in the book I wrote on beekeeping called "Las Abejas."

In winter the principal honey plants are the wild "Reseda" **(Reseda Luteola)**, the hoarhound **(Marrubium vulgare)**, wild turnip **(Brassica campestris)**, and wild mustard (**Sinapis nigra**)—in the spring the mesquite and several less important ones—in the summer and part of the autumn the Chayotillo **(Sycios angulatus)** and the wild sunflower **(Helianthus sp.)**.

In the tropical zone there are plants producing honey all the year round, such as the different kinds of palm trees which bloom in every month. Another important honey producer of the tropics is the mangrove **(Avicennis Nitida)**. Besides the great number of wild plants there are many cultivated ones which also produce honey, for instance: alfalfa, chickpeas (garbanzas), oranges, limes, coffee, bananas, etc.

A regular colony produces in the high tablelands an average crop of from 75 to 120 pounds of honey in a year, but in the semi-tropical and tropical zones the crop is almost twice as much.

Preparation of Colonies for the Honey Flow.

The colony should be ready for the spring crop the first days of February and for the autumn crop in the last days of August. To get the bees into the right condition in order to obtain the biggest crop possible, six weeks before the honey flow starts I take away all the combs with honey with the exception of two full ones, replacing them with empty worker-combs. The combs with honey are put against the walls of the hive, one at each side and the eight empty worker-combs are placed between them. The honey combs on the sides will protect the bees from chilly nights. I then start to give them every night a little thin syrup composed of one part sugar and two parts water. Honey may be used instead of sugar if it comes from a healthy colony, but sugar is better because it does not attract so many robbers. Only a small amount of syrup should be given in order to prevent the bees from filling the cells again with honey. I use this method when the colony is small. Of course, the queen must be vigorous and the colony not too small, otherwise it will be a failure. A regular colony will build up by itself and be in a good condition at the right time if it has plenty of stores.

Swarm-Control.

Swarm-control, as in other countries, is here one of the most difficult problems. The natives who use small box hives have sometimes excessive swarming. The best way to have some control over swarming is not to use too small a hive. For this reason the Langstroth hive is too small for Mexico. The Jumbo hive with 10 frames is better adapted to this climate, and possibly a hive with 12 or 13 frames is still better. The Jumbo always gave me the best results, and when I was in the government service as a beekeeping expert and propagandist I recommended it always to my pupils, who adopted it almost without exception. It may be said that the Jumbo is here in Mexico the standard hive.

The prevention of swarming by the "shake" and "brushed swarm plan" gives here the best results, especially when the bees have already shown some intention of swarming. Besides it is the right thing for a comb-honey producer.

When running for extracted honey I prevented swarming with great success by the following method: At the beginning of the honey flow before bees have started queen-cells, I open the brood-chamber of the strong colonies and take out five of the ten combs. Then I put in five frames with full sheets of foundation, alternating them among the brood combs. A queen-excluder is then put on this brood-chamber, and an empty body is placed on it containing the five combs previously taken out and five frames with foundation arranged in the same way as in the brood-chamber. The queen must remain below. In this way the bees have plenty of room, and there is no reason for their swarming.

Apiary and workshop of the School of Agriculture and Veterinary Science in Mexico City. A great number of nuclei was sold every year and sent to various states of the Republic of Mexico.

The honey market is somewhat limited in Mexico, because the Mexicans don't eat very much honey and only a few bakers use it. The Mexicans think that honey hurts the throat. This is because most of them have tasted only dirty press-honey sold by Indians, which irritates the throat on account of its impurities. Those who have had an opportunity of trying pure extracted honey sold by a modern beekeeper change their minds immediately.

Fortunately we have not so many diseases in the Republic as in other countries. American and European foul brood are unknown here. During the eight years I traveled thru the country I never found a case. Modern beekeeping has developed very nicely in the last 10 years. When I entered the government service as the first beekeeping expert in Mexico in July, 1909, there were only about five modern apiaries known in the Republic, the rest being composed of old box hives, which mostly belonged to Indians. At present up-to-date apiaries may be found in many of the various districts of the country.

Mexico City, Mex.

FROM THE FIELD OF EXPERIENCE

IS IT HEARTSEASE?

Should Beekeepers Use Common Name or Latin Name for this Plant?

The A B C and X Y Z of Bee Culture, as well as many other good authorities, call a certain honey-bearing plant "heartease." It would seem to matter but very little just what we call a certain article so long as we all understand what is meant by the name, but where do you get your authority for calling *Polygonum persicaria* heartsease? I will admit that the name sounds better than smartweed when one is offering honey for sale; but why not call it polygonum honey? This would somewhat mystify the prospective purchaser, and that is what the average American seems to desire.

I have looked up all of the authorities within my immediate reach, and here are some extracts from them. Webster's Unabridged (not a recent edition) says:

"Heartsease—Ease of the heart, etc.; *viola tricolor*; called also pansy."

Chambers' Encyclopedia says:

"*V. tricolor*, the pansy, violet, heartsease, etc."

Then it goes on to enumerate the various violets, pansies (viola), and is entirely too long to quote in full. This same authority, under the head of "Natural order, Polygonaceae, gives a description of numerous species of this plant that corresponds to what we here in Missouri call "smartweed," of which some three or four varieties grow in this vicinity. This same authority includes buckwheat in this order, but does not anywhere in the description mention heartsease.

Henderson's Handbook of Plants says:

"*Viola*, violet, heartsease; pansy. The old Latin name used by Virgil," etc. Under this head Peter Henderson described many species of violet or pansy, but no mention is made of anything that corresponds to what we call smartweed.

Turning to Polygonum, natural order Polygonaceae, I find this:

"*P. hydropiper* is our well-known smartweed." On the opposite page is an excellent illustration of an ornamental variety having variegated leaves, which is very much like some of the varieties growing here. Nowhere, however, in the article referring to this order does he mention heartsease.

I believe the late Prof. A. J. Cook called the plant referred to "heartsease"; but in glancing over his Beekeeper's Guide I fail to find mentioned either polygonum, heartsease, or viola. Now, is polygonum the same as heartsease, or is viola the same as tricolor? One or the other must be wrong. I know that many plants have many different local names; but it seems to me that we beekeepers ought to know heartsease when we see it, and not call a plant heartsease when it is not so known to botanists.

As stated above, we have several varieties here on the Missouri River bottom lands as well as on the smaller streams. One looks very much like the cut in the A B C and X Y Z of Bee Culture, the flower being rather insignificant and of a greenish-white color, while the plant is rather coarse and large. I do not think this variety yields much nectar. From that we have varieties ranging up to one that bears a beautiful well-rounded-out flower of a delicate pink color. This flower is handsome enough to be entitled to a place in the flower garden. All of these varieties grow in great profusion on overflow land, and also more or less in cornfields after the last cultivation, as well as on wheat stubble when the land has not been broken too soon after the wheat harvest. Some years this honey is gathered along with boneset, and blends very admirably with it; but when the polygonum is in great profusion the bees seem to neglect the boneset and take almost exclusively to smartweed. The honey is pale amber in color, of good body when well ripened on the hives, and in quality, to my taste, it

Heartsease, sometimes called smartweed.

ranks close to white clover. This and boneset seldom fail to give a fair to good yield of nectar in this vicinity. S. E. Miller.

Answer by Lovell.

In the employment of the common or English names of flowers we are governed entirely by usage. There is no hard and fast rule as in the case of the Latin names. The same species may be called by a dozen different popular names, by one name in one locality and by another name elsewhere. Or the same name may be applied to three or four very unlike plants; for example, loosestrife is the name of three plants belonging to entirely different genera; fireweed, elder, dogwood, and clover are other examples. In all such cases we depend for the identification of the plant on the Latin name, which is determined with extreme care.

The English name ''heartsease'' is universally used by American beekeepers for the well-known honey plant *Polygonum persicaria.* It is always thus referred to in conversation and in our bee books and bee journals; and every beekeeper knows what plant is meant. This must be an old name for this plant, since it was invariably used by such a veteran beekeeper as Dr. C. C. Miller. This plant is also called lady's thumb, heartweed, and knotweed, all of which are given in the A B C and X Y Z of Bee Culture. The names heartweed and lady's thumb doubtless come from a dark-green irregular blotch or spot on the center of each leaf, which may be variously imagined to represent a heart or the imprint of a thumb. From this it was an easy step to suppose that the foliage was beneficial in heart troubles, and hence the name heartsease. The fact that the same common name is also used for the pansy makes little difference any more than in the case of fireweed and scores of other plants. Knotweed is a translation of the Greek word *Polygonum.*

This particular honey plant, *P. Persicaria,* should not be called smartweed. There are 24 species or kinds of knotweed or polygonum in northeastern America, and two of these *P. acre*—acre is Latin for sharp—and *P. hydropiper*—hydropiper is Greek for water pepper—are properly called smartweeds. The leaves are acrid and pungent, due to small glands which secrete an acid. The name smartweed should be restricted to these two species.

The name commonly given in the botanies for the honey plant *P. Persicaria* is lady's thumb; but, in the matter of common names, in the case of the majority of species the botanies usually give no common name at all. For the most common plants they seldom give more than one or two English names; while, as in the case of the boxberry (*Gaultheria procumbens*), there may be a dozen. The name gallberry is not given in the floras, but all beekeepers know a valuable southern shrub by this name. Its omission from the botanies is the result of indifference or an oversight. If we were to speak of ilex honey few would understand this name, and the same is true of polygonum honey. It is because we can not rely on the popular names for the identification of plants that we have the Latin ones.

Waldoboro, Me. John H. Lovell.

* * *

ADJUSTABLE WINTER ENTRANCE

A Two-Colony Winter Case, Embodying Some New Features

My packing cases are modeled somewhat according to the description given in Farmers' Bulletin 1012, United States Department of Agriculture, but there are some differences. They are made 48 x 35 x 35 inches, and accommodate two two-story hives, side by side, facing south. The bottoms are made of rough lumber nailed to the two-inch surface of 2 x 4's in such a way as to make a rim extending around the outside, the 2 x 4's extending upward their full width. The hives are set on other 2 x 4's, so arranged that the bottom-board of the hive is level with the top of the 2 x 4's on the rim.

The sides and ends are all separate, and project below the cleats, to which they are nailed, about 1½ inches. When the cases are put together, these cleats set squarely on the bottom rim, while the sides overlap the rim 1½ inches. To nail the cases together requires just eight nails, one each in the four upper corners, and one each thru the center of each side and end into the bottom rim.

The cover is telescoping, and is made of pine flooring, covered with a cheap grade of roofing.

The tunnels are 8 inches wide at the top, and 6½ inches wide at the bottom, to allow for the projection of the bottom-board. They are 1¾ inches deep, and as long as the distances between the two side cleats of the bottom-board. One end rests on the bottom-board; the other on the rim of the case.

In the front of the case an opening, one inch wide and as long as the combined width of the hives, is made so that the bottom of the opening is even with the bottom of the tunnel. These openings are closed by doors, hinged at the top, and opening outward from the front of the case. Each door has four ⅜-inch holes bored thru it, connecting with the tunnels. In cold weather the doors are closed by means of a single screw; but, if there comes a day when the bees can fly safely, the doors can be opened, and the entrance to the tunnels will be flooded with sunlight, so that the bees will be in full flight almost as soon as those in unpacked hives. In the spring, if the bees are getting crowded for more entrance space, all that is necessary is to loosen the door just enough so that the bees can pass between it and the front of the case.

While this case is rather expensive, my cases more than paid for themselves in increased honey production the first year. I have tried both flooring and ship lap for the sides, but prefer the ship lap because it is lighter in weight and less expensive.

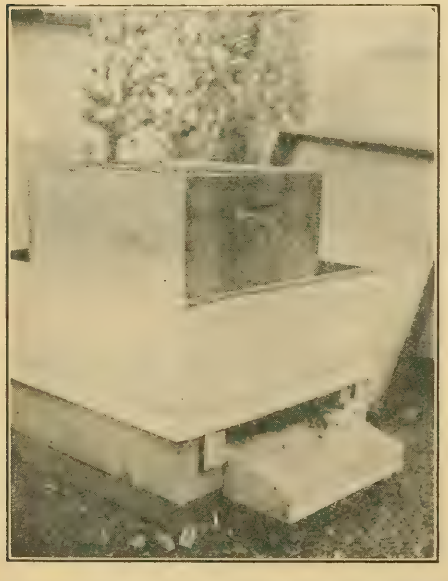
St. Charles, Iowa. Paul Laird.

* * *

BUILT IN WINTER PACKING

How Uniformly Successful Wintering is Accomplished in British Columbia

The appliances and the methods used by W. J. Sheppard, Chief Apiary Inspector for British Columbia, were not evolved all at once, as they have been the result of several years of close study and numerous experiments, until a system was worked out, that, by its convincing results, in regard to good wintering and large honey crops, acted as such a strong inducement that almost every beekeeper in this territory has adopted it of his own free will. Now one can travel over this whole region and see a large number of hives, all looking the same and working the same. This, as most beekeepers know, is unusual among people who keep bees. This much desired uniformity reflects great credit on the educational work carried on by Mr. Sheppard with lantern slides and demonstrations.



The outer entrance is two inches deep, the upper portion being covered with a strip of glass in winter.

It must be understood that this system was worked out entirely to suit the conditions in this particular region where the winters are long and cold, followed by a prolonged building-up time and a late honey flow. The most striking example of the suitability of the system was the man who in 1919 obtained 2100 pounds of honey from three colonies, spring count, and increased to ten.

Extra stories are added to the outer case as additional supers are put on.

The backbone of the whole system is the Kootenay hive-case which is used all the year round and always kept packed. This hive-case provides a three-inch space for the packing all around the hive and has a packed bottom as well. The outer entrance is two inches high and extends three inches under the bridge to the hive-body. The entrance block fits in this space against the hive-body. The inside entrance cut in this block for winter use is three-eighths of an inch by three inches. A very useful addition that has been made, is a strip of glass covering the upper part of the outside entrance, leaving a three-eighth inch space underneath. This makes a sort of sun porch between back and front entrance, and in actual practice has been found to cause all dead bees to be carried out all the winter long. With this glass the bees also fly far less when the snow is on the ground.

The bees are wintered in a single ten-frame brood-chamber of Langstroth frames. In the spring a second hive-body is added, which the queen soon occupies; then just before the honey flow the queen is put down again, and an excluder is put on to keep her in the lower hive-body. Others are added on top as necessary. Extra stories are also added to the outer hive-case to keep pace with the supers; consequently there is no overheating from the hot sun, and the bees neither have to stay at home to keep up

FROM THE FIELD OF EXPERIENCE

the heat, nor to keep it down, as so often happens with the single-wall hive.

North Vancouver, B. C. Will H. Gray.

FALL TREATMENT

How American Foul Brood Can be Treated After the Honey Flow

The first thing we do when we find foul brood is to clean it up. We do not wait for a honey flow nor the spring of the year. If in the fall, we brush on frames with a cloth hung over each frame and let the bees stay there until they have used all of their honey. Then we give them two or three empty combs in the center of the hives for a winter nest, and fill up the balance with full combs of honey. We do the same thing in the spring before the honey flow.

If the diseased colony is a good, strong one and there is a honey flow, we use foundation; otherwise, we use the combs altogether. We brush the bees in the evening when all of them are at home. Then we know there will be no robbers to carry the diseased honey to their own hives.

Don't shake the bees but get a good bee brush and gently brush them from the combs. We have seen beekeepers shake honey all over their clothes, shoes, and the front of the hive. Of course, other bees alight and sip up these drops of honey and take it home. If the honey is all sealed over then there can be no harm done in shaking them.

If we brush in the evening no robbers will be there. The bees are more apt to stay and by morning they at least get partly over their shock. If we doubt their staying, we shut them in and make them stay for 24 to 36 hours, then give them combs and we have never had one leave yet.

Parowan, Utah. M. L. Skougard.

WINTERING IN TWO STORIES

Some of its Disadvantages. Contraction of the Winter Chamber

For some years we have been advised by our bee experts in Washington to winter on two-story hives with two full sets of combs per colony. Mr. Demuth says the extra set of combs is a bee-feeder of the best kind, works automatically, and does not require refilling; but there may be some disadvantages to this arrangement.

When I go to bed on cold evenings I feel nearer comfortable when I have my bedclothes tucked snugly around me, not hanging loosely over the bedposts. Twenty quilts applies thus would fail to keep me warm. Our old friend, A. I. Root, defended this principle 45 years ago, and I believe he was right. I believe that the smaller the brood-chamber during the cold winter months, provided there are enough winter stores in the combs. the better will the bees endure this trying season. I can see no particular advantage in an extra large brood-chamber during the cold season, except that the bees may cluster high up away from the draft coming thru the entrance. Whenever I tried the double story I found this disadvantage: dead bees falling down, filling up the spaces between the combs, producing dampness and mould; whereas, with the single story, the larger portion of the dead bees are pushed out of the entrance.

I must admit I never used the excessive packing of eight inches. I call it excessive because I think eight inches of packing is more than is necessary. Of course it will make a difference what kind of packing is used. Three inches of chaff (clover hulls are fine) is probably the equal of eight inches of hay or straw. Eight inches of clover hulls or wheat chaff, in the light of my experience, I would consider excessive. I am loath even to try out an eight-inch packing of chaff when three inches seems ample in my yards in New York State.

When A. I. Root advanced the idea of winter contraction, tucking the quilts and chaff cushions around snugly, many of us followed up this theory. In October, when the brood-combs were free from brood we removed a portion of them containing the least honey, usually from the center, pushed the combs together, and filled out the spaces on the sides with chaff cushions. We wintered many colonies on five Jumbo frames very successfully, but when the number of our colonies and yards increased and we were lacking cushions (division-boards), and also on account of the extra work necessary to contract the brood-nests, we did not push the method. The disturbance of our bees so late in the season was another factor which caused us to content ourselves with wintering on our regular 8-frame brood-nest (Jumbo frames).

About 15 years ago I put quite a lot of sectional 8-frame hives into use, of which two are the equal of 8 L. frames. My bees in them with a moderate amount of protection winter well; the bee-space between the two sections seems rather an advantage. I rarely resort to three sections per colony, and then only if a colony is short of stores, when a section solid full of honey is placed on top. If these colonies were in the honey yard, I might take the bottom story out before packing. In mentioning what I have said I wish to tell only what our practice has been, not that we have followed the best methods.

My problem. as yet unsolved, is to know

beforehand whether or not our bees will come thru with such stores as they may have. When the winter is over we know, but not before. If we should feed each colony ten pounds of sugar syrup late in the fall we might expect the bees would use this syrup first and pass the critical period; but we might have to keep up this practice for ten years in order to hit that one year when it would be necessary. This would be expensive. We have also wintered our outdoor colonies very successfully on the very poorest stores, honeydew, when a very favorable open winter happened to follow. All things considered, we have to admit that wintering bees is still problematical.

Naples, N. Y. F. Greiner.

BEHAVIOR OF VIRGIN QUEENS

Do Worker Bees Prepare the Virgin Queen for Her Mating Flight?

On August 1, last year, I gave a 10-day-old queen-cell to a rather strong nucleus which had been formed on July 28 in the afternoon. I examined the nucleus carefully and saw that the combs contained only sealed and emerging brood, the combs used in forming the nucleus having been "ripened" for one week previously over a queen-excluder. On August 8, about 11 o'clock in the forenoon I opened the hive and found the cell empty. A little afterwards I saw the young queen coming across the comb, surrounded by seven bees which apparently pulled at her or tried to block her way, even when, as it looked to me, she was trying to get away from them. I first thought that it was the commencement of a balling of the queen, but thereafter that the queen had possibly returned from her mating trip and the attendants were now endeavoring to remove the appendages from the queen. However, no traces of such were to be seen. I looked closer and saw that while the queen was continually trying to cross the comb, the bees (three on one side of her, and four on the other) would stop her, and start to rub or clean her abdomen, from the thorax and down, sometimes with their antennae, but sometimes also with their tongues. Now and again the queen would put down her head to the comb, stretching her antennae forward and whirring her wings, at the same time either curving the tip of her abdomen forward, as does a bee when trying to sting, or raising the tip of her abdomen up in the air, as do the bees sometimes before moving into a new hive. After this had happened some six or seven times, the queen finally went to the top-bar of the frame alone, walking to the end where she suddenly, and to me quite unexpectedly, took flight, in a manner which I cannot describe better than by saying that it looked somewhat like a butterfly sailing away. As I could not follow her flight, I stepped back and closed the hive. August 15 I found a queen nicely laying, which I feel sure was the same one which I saw flying away.

The case struck me as rather peculiar, but in reading Doolittle, the thought has come to my mind, whether the worker bees do not in some way or other prepare the queen for the wedding trip, perhaps even deciding the time? The passages I refer to in Mr. Doolittle's book read as follows:

"My hobby has been that of letting the queens fly out to meet the drones, the same as they always do, yet without despoiling colonies, by making nuclei to keep them in from the time they were hatched till they commenced to lay. My first plan was to take virgin queens from eight to ten days old, into the fields to places where I believed that drones congregated, by the loud roaring which I heard in high altitudes, between the hours of 1 and 3 o'clock p. m.

"I would then let them out of the wire-cloth cages which I had carried them in, leaving each one in a separate place, near some old stump or stone, from which they could mark the location of their cage. The queens would mark the place from which they went, the same as they would when coming from a hive, circling farther and farther, till lost from sight, some of them being gone a long time (long enough to meet a drone) when they would return and re-enter the cage, and if I was on hand they could be easily secured again; but I have to report only failure along this line. If allowed to do as they pleased, after returning they would fly out again and again, till they would finally go off, never to return.

"My next plan was to take a very few young bees and a little piece of comb in these cages, but with this I was no more successful. Why no queen should ever come back under such circumstances, bearing the marks of fertilization, is more than I can understand, yet such has always been the case.

"Thru the suggestion of Mr. A. D. Jones, I next tried putting the queen over a hive of bees, keeping her in a double wire-cloth cage, the wire cloth being so far apart that the bees from the hive below could not reach her, while an entrance was made from the cage to the outside of the hive thru a tube. Here the queen would stay, with no apparent desire to go out, any more than she would if she were kept in a queen-nursery till she was too old to become fertilized."

Does it not look as if the contact with the bees, or rather the non-contact, has been of consequence? Alex Holst.

St. Thomas, Virgin Islands.

SIFTINGS

J. E. Crane

"THE silver lining appears," says the editor of Gleanings, page 550 of the September issue. Let us all be very thankful that honey is so plentiful and the price so low that the poor as well as the rich may enjoy it and have an abundance. Our pocketbooks may be thinner, but our hearts will be enlarged and we the richer in the end. To feed the hungry and give drink to the thirsty are little virtues that pass at their full value in the next world, I have heard.

* * *

One cannot read E. R. Root's account of the Hubam sweet clover in September Gleanings without his pulse being quickened and life seeming more desirable, the possibilities and value of this clover appearing to be so great for the production of human food, as well as food for domestic animals and for enriching the soil. This plant is certainly great, and its discovery should mark a new epoch in American agriculture. Great as this discovery is, it thrills one even more to find such an unselfish whole-souled man as Professor Hughes in this self-seeking age.

* * *

H. F. Wilson makes some nice points in his article commencing on page 555. He would not do away with the middleman. "Brokers, jobbers, wholesale merchants, and retailers must be paid for their efforts, and they must have a small profit in order to do business. These agencies are absolutely necessary to get distribution, and can not be eliminated under our present marketing system." He is right. Let us not forget it, nor undersell them. He would have a standard tin package and would prefer two and five pound tins. We are using three and five pound tins and find them to work very well, altho the three-pound quart tins are a little small and difficult to seal when hot. On page 556 he says these tins can be easily sent by parcel post. He is right if we first put them in corrugated cartons and seal them. We sell lots of them in this way. He cautions against selling in large quantities at one time to new customers. Good advice. "Sell a new customer who is not accustomed to honey a sixty-pound can and be prepared never to sell to that customer again." It is better to sell sixty pounds in small lots as needed than a large amount at one time.

* * *

There are four long articles in September Gleanings in Bee Culture on marketing honey, which, if read and the advice given followed, should dispose of hundreds of thousands of pounds of honey in the home market. I haven't room to review all the good things said. Every one who has a large amount of honey to sell, or a small amount, cannot fail to receive benefit. Robinson Newcomb says on page 557, "It takes time for a motorist to make up his mind he wants to buy;" hence the signs should be in letters large enough to be read 400 feet away. "The sign can be read farther away if the letters themselves are dark; and it can be read later in the evening.

On page 559 he says: "Clear glass jars show up light-colored honey best. Slightly green jars may be used advantageously for honey that is very yellow, since the green glass makes yellow honey appear white." I wonder if this is quite straight. He does not approve of Sunday selling. Thinks it doesn't pay, altho he thinks more sales may be made on that day than on any other. "Roadside selling," he says, "is a big advertising work. Our signs remind passing motorists of honey day after day, bringing many to buy honey who would not otherwise have thought of it."

* * *

That is a right good article by D. L. Woodward on underground cellars. I wish I had one that would work as well. There seems to be some question whether an underground cellar will prove a success or otherwise. So far as I am able to learn, when such cellars are built in dry, gravelly, or sandy soil they prove a success, and when built on clay soils they are apt to prove unsatisfactory. I wonder if the soil makes the difference. I was in a winter repository a few weeks ago in the east part of our State where bees wintered perfectly. A good deal of the cellar was above ground but banked heavily, and the floor above was covered with sawdust.

* * *

Under the title page, "From the Field of Experience," is an article by my friend, A. C. Miller, that will give us beekeepers something to think about, but on reading it, it seemed to me that he was writing from the field of speculation rather than experience.

* * *

E. G. Miller says, on page 560, "The best advertisement is the honey itself." He, too, cautions against selling for family use in large amounts.

OUR FOOD PAGE

CONSTANCE ROOT BOYDEN
(Stancy Puerden)

THIS picture of one baby admiring another was taken Sept. 3 in accordance with my promise to keep the Gleanings readers informed of the progress of the two fast-growing walnut trees which Mr. Luther Burbank sent me last November. The human baby was borrowed for two reasons:—she is more ornamental than a wooden yardstick, and as she is the great granddaughter of A. I. Root it seemed fitting that the achievements of two old friends should be shown together. She is exactly 37 inches tall.

Last November this particular tree was a mere twig with two or three fat buds near the end of it. When planted it projected not more than eight inches above the ground and had to be protected by wire netting to keep someone from stepping on it. It is the Paradox which is supposed to survive in climates similar to that of California. Whether it will survive one of our old-fashioned Ohio winters time alone will tell, but we are going to do our part by cuddling the trunk with a nice straw blanket inclosed in netting to keep out hungry rabbits. Unfortunately the photograph does not show the trunk, which has grown thick and sturdy, about an inch in diameter.

The hardier one of the two trees, the Royal, altho it looks perfectly healthy, has not made remarkable growth; but, from my experience with other shrubs and trees in our clay soil, I am hoping it will make up for it next year, in which case it shall have its picture taken too.

ADVERTISING has always interested me. When my favorite woman's paper comes—I have all of a half dozen favorites—I always glance over the advertising pages before I read the magazine itself. It is like a quick shopping trip, including a visit to the food show, and has the advantage of not tiring one. And it keeps a housekeeper up to date on foods and their preparation and all household conveniences, and helps maintain her enthusiasm for her job.

Being interested in all advertising I have naturally given much thought to honey advertising, with the result that I am coming to the conclusion that we honey people are making a mistake when we push the use of honey in cooking in advertisements designed for the general public. This statement from a woman who was engaged to write a food page introducing the use of honey as often as possible sounds inconsistent, doesn't it? But you see this food page is for beekeepers' families who have an abundance of honey of their own and to whom it is frequently an object to use as much honey in cookery as possible.

In the first place, as I have said many times before, it is too bad to injure the flavor of fine honey by heating it to the degree necessary for cooking and baking, unless it is used in some dish which is very much improved in flavor or texture by the use of honey rather than sugar. It is degrading a delicious table sweet, all ready for use, to the level of an inferior cooking syrup. Jams, fruit butters, and preserves may be used in cake baking and otherwise in cooking, but their use in that way is almost never mentioned in advertising them.

When honey is at its best in the natural state, in this age when we are constantly told by dietitians that we should eat more foods in the natural state, why should we urge housekeepers to regard honey as an ingredient of other foods rather than as a most attractive and delicious food itself? I know perfectly well that it is now fashionable for food advertising to contain recipes or an invitation to send for a cookbook; but I am trying to make the point that honey is not in the class with baking powders, patent shortenings, pastry flours, and cooking syrups. I should class it with grapefruit, oranges, dates, fine marmalades, and choice candies, foods which are far too good to be used in common cookery, but which may be included occasionally in some exceptionally fine dish. Also honey has the advantage of the delicious but perishable fruits in that it will keep practically indefinitely and should therefore have a place on every housekeeper's emergency shelf, if it is not in daily use, as we beekeepers think it deserves to be.

In the second place, it is not quite as easy to cook with honey as with sugar, and for that reason I very much dislike to recommend to the general public many of the cake recipes which call for honey. Lest some of you fortunate beekeepers who are married to expert honey bakers think I am talking heresy, let me tell you several incidents, out of dozens I could relate, to prove my statement.

A friend, who is a competent housekeeper and one of the best cake makers I ever knew, recently said to me, ''Do you still recommend honey for cooking and baking purposes?'' Then she went on to say she had bought a ten-pound pail of honey during the sugar shortage of the war and that she had never had any success in baking with it, altho she used recipes from a honey cookbook, that most of it was left in the can and she did not know what to do with it. That extracted honey had any use except as a cooking ingredient did not seem to occur to her.

A year ago I gave a can of Cream of Honey to a friend. You may recall that I described Cream of Honey some time ago in one of these articles. For those who did not read the former article I will explain that Cream of Honey is the trade name of an especially fine article of crystallized or candied honey which has been brought to an exquisite fineness and smoothness by a special process. Next to a perfect section of comb it is my favorite honey and I often give it to my friends. On the outside of the lithographed can are three recipes which I worked out to please a certain honey man. Some months afterward I met my friend and she said, ''I am ashamed to say that I have not yet tried that Cream of Honey. I have been so busy that I have had no time to try new recipes, but I mean to soon.'' And then I discovered she supposed it was not ready for use, that she inferred it was similar to the marshmallow cream which is sold for cake filling, puddings, and the like. She was delighted to find that it is at its best as a spread for bread, biscuits, waffles, etc.

The editor who engaged me for Our Food Page more than four years ago has a wife who is a far more competent cake baker than I am (I might not be quite so ready to admit it if I thought that editor was likely to read this), and she insists she cannot make as good a cake with honey as without. Just among ourselves, I am quite positive she could bake certain varieties of cake with honey, if she tried hard enough, but I am telling the story only to illustrate my point. If Mrs. Editor is not very successful baking with honey, do you imagine that women who are not especially interested in promoting the use of honey are going to make an effort to use it? Notice I say ''make an effort.'' Many housekeepers delight in trying tempting new recipes calling for novel ingredients, but if they fail on such a recipe they are not going to try that ingredient a second time. That is why we should be so careful that only safe recipes, worked out with accurate, level measurements and standard proportions are recommended to the general public.

When I read a honey advertisement which recommends honey for cooking and includes an impractical recipe, a recipe with which I know I should fail myself, it makes me feel that such advertising is certain to prejudice housekeepers against nature's finest sweet. For instance, white or light colored cakes which are raised with baking powder are extremely difficult to make with honey as the only sweet. I am going to admit right now that I have never baked one which I called a success. You may argue that this proves that I am not an expert honey baker, but you must admit I can probably do as well as the average housekeeper, and if I fail Mrs. General Public is likely to fail also.

Frostings or icings made entirely of honey or with a very large proportion of honey are also very difficult to make. The syrup must be boiled to a higher degree than a sugar syrup or it will be of that exasperating type which gradually but surely runs off the cake or sinks in and out of sight. At its best, honey frosting is sticky and not apt to find favor with anyone who is not an enthusiast for the honey flavor.

While delicious preserves and jellies may be made with honey they are more difficult to make than with sugar for the reason that honey scorches easily, and even if it does not scorch it is apt to acquire a caramel flavor and darken unless done with extreme care. You and I may be willing to give that care to attain the result with its honey flavor, but again I do not believe the general public would be apt to do so.

After saying so much about what honey advertising ought not to do, it is quite time to consider a few of the things it ought to do, isn't it? I firmly believe that the very best way to popularize

(Continued on page 659.)

Beekeeping as a Side Line

Grace Allen

THE sideline beekeepers of the country are like a big affectionate family. Drawn together by bonds of enthusiastic interest in the same great live subject, they are necessarily interested in one another's experiences. Which is why this department is this month beginning a short series of sketches of sideliners, big and little, known and unknown men, women, and children (almost).

John Bieseman's Three B's.

The three R's have long been famous for their unpopularity with many younger generations of civilized races. It is the three B's that hold the attention of John Bieseman of Hemlock, O. "Birds and Bees and Blossoms"—thus he enumerates his three great interests. What a combination that is! He is a photographer, too, and his charmingly harmonious sidelines, the three B's, are made still more fascinating by the pictures he takes, often catching and preserving bits of perfect but transient beauty otherwise lost.

Being a specialist in any line is commendable, of course; but to be a specialist and nothing else must be most tiresome. "The world is so full of a number of things" that any limitation of interest, any "circle premature," is like a thief stealing from us some of the wealth that is ours, some part of our ancient divine inheritance. To claim an interest in the threefold world of bees, birds, and flowers is to make oneself master of the very heart of this ancestral domain.

Blossoms.

Mr. Bieseman's interest in flowers and his careful observation are shown in a letter written to help establish the identity of a plant unknown to a fellow beekeeper. "I have only on two occasions found this plant in our locality," he wrote, "both times near the edge of a wood. The first time I met several plants growing together on almost bare ground, where potatoes had been grown for two years previous. This was new ground—forest trees had been felled (the pity of it!) just prior to the planting. These were fine specimen plants, apparently the select of their growth; square stems of a wiry appearance, and the leaves, very inconspicuous, lent it a skeleton appearance. The flowers, small and a purple red, were the curiosity of the whole. The entire plant presents a striking, singular appearance, and I was attracted to it by many bees. If this plant were of a weedy nature it would surely have accumulated here; but the following year and the next, no trace of them could be found."

Then, after chatting easily about the Pulse family and the Figwort family and the Mint family and Mrs. W. Starr Dana's book, "How to Know Wild Flowers," he runs on into bee talk, of queen-rearing and winter packing and foul brood, or, another time, into bird talk.

Birds.

"We have had a variety of birds in our yard for the last few years. I commenced to attract them during the winter, which can be done at the window shelves, to the great entertainment of the occupants within. We have quite a variety of birds that nest in our yard. A number of years ago a pair of phoebes brought their fledglings to our home apiary next door to me and they were seen to catch workers which they fed to their young. I have not observed them in our yard since. These birds nest from overhanging rock, and also where they find shelflike room on architecture, away from sight of human presence. Just now a robin, a woodthrush, and a white-throated sparrow are diligently searching the garden ground within a few yards of my window. Insect life is bound to be reduced here where they glean for such morsels several times a day; and when they have young, they will need ever so many more. . . . You can learn quickly what feeds to put out during the winter to have the choicest of small birds around you. Almost all the insect-eating birds will eat suet during the winter; sunflower seed is the staple bird food here; nut kernels also by many; hemp is also much eaten. A bird in the yard is worth two in the cage, as to entertainment and economic value. These winter-feeding birds are far in advance of others in early song and nest-building. The cardinal, song sparrow, and others are singing as volubly now (February) as if it were springtime. They will build their nests close by and feed their young from insect life around us, thus freeing our crops from much injury. . . . This morning I had a mocking bird in the yard close to the cottage. It ate from the branches of bittersweet berries which I have on the feeding shelves."

Bees.

Altho his father had been a beekeeper for years "in a more primitive way," having once as many as 70 hives, it was not until 1916 that Mr. Bieseman began keeping bees after his own fashion, with modern hives and progressive methods. Because of a steep rocky hillside, he placed his hives in long close rows, on such stands as he could devise to fit the requirements. There, packed in dry leaves in long sectional cases, they meet the snows and winds of winter.

He has reared his own queens, and has decided from careful records and observations that his losses of virgins were not to be laid to birds. Many beekeepers, he is convinced, lay their ill success in queen-rearing on the birds, when the birds are not to blame.

He had an interesting experience in the summer of 1920. Some old homemade hives were stacked up by the side of the barn. One day he noticed some bees, evidently scouts, inspecting this stack; and two days later in came a good-sized swarm of hybrids. He took them from this hive, set them where he wanted them, and requeened them. A few weeks later scout bees came again to the same top hive on the stack, and the next day came another swarm—black this time—"totally black—from some distant tree. These last were amusing to me; being the pure blacks, they showed traits so different from my three-banders. Wherever there was anything to rob, they were always first."

Unfortunately he has had to fight American foul brood for the past two years—discouraging work for the sideline bee-lover. If it continues in that territory, requiring treatment each year, he says he will keep only a few colonies, as "I never care to treat 26 hives with combs again as I did last summer; this is some weary toil."

How John Bieseman helps his bees meet the snows and winds of winter.

A Pair of True Amateurs.

In the unforgettable year of 1914, when men

". . . heard the news, and went discouraged home,
And brooded by the fire with heavy mind,"

Mr. and Mrs. John T. Carlyle, successful stage people living in Detroit, went to East Jordan, Mich., and bought a ten-acre piece of real earth. Their first summer there they started their beekeeping career with two colonies. In the summer of 1920 they had 33 colonies and an equally increased enthusiasm. Every autumn in late September, before leaving their summer work-and-play-ground for their winter's work, they pack their bees safely away in quadruple winter packing cases, and face the footlights thru the coldest weather with easy apiarian consciences. Then in May, when their season is over, they come back to their bit of earth, where there are greenness and birdsong and silence and sun on the grasses and the miracle of growing things. And they promptly unpack the bees, for "of course," writes Mrs. Carlyle, "our 33 colonies come first and foremost. I *love* bee culture, and almost everything else on the place seems a waste of time compared with the bees." There speaks the true amateur beekeeper.

And catch the enthusiasm of this: "We have had lots of wonderful experiences this year. During the past two weeks I have extracted (during Mr. Carlyle's ilness) 850 pounds of honey from 17 supers. We have to put the escapes on 9 more supers, as we wish to extract again on Friday. Once we had two swarms at the same time. One we saw issue, and we caught her Majesty and caged her, and hived the swarm by removing the parent hive to another stand and releasing her Majesty in the empty hive; we gave her a frame of brood later to keep the dear nurse bees busy. Upon finishing that swarm in a most scientific manner (we think), there was another great big swarm, *something mammoth!* We could not get a good negative of it as everything seemed to be moving at once (we included). We had not the remotest idea where it came from. We made a journey from hive to hive and everything seemed to be peaceful, happy, and busy in all of them. So we shook the swarm from the apple tree into an empty ten-frame hive, and later gave them a frame of brood to keep the nurse bees happy."

Might not that take even the most staid and unthrilled professional back to his own early experiences, when just to open a hive was exciting and every separate incident was an adventure?

Then there is their fun of marketing. "We have not sold it to any stores, just to the summer resorts around here. We have a Ford and use that for our 'Honey Trips'—always taking between two and three hundred pounds with us and *always* selling out before we return home. It usually takes us about half a day to sell out these amounts"

Now Mr. and Mrs. Carlyle might go to some resort for their vacations and spend most of their time playing golf. That, however, would mean a considerable expenditure, whereas the bees may come to mean a considerable income. Moreover, this sturdy simplicity of living brings its own great spiritual income, too, of large satisfactions and renewed reverence and inner peace.

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In Northern California. — It is never a pleasant task to depict unfavorable conditions. We have now practically pre-war honey prices and, if there be any difference, it is between the amber and white grades. The amber grades are just about where they were six or seven years ago, namely, around 6 cents per pound; but the white grades, principally sage, are somewhat higher in value. The widening of the gap between these two grades is probably due, on the one hand, to the increased consumption of white honey put up in various-sized small containers; and, on other hand, to the part in which low-priced sugar can play as a substitute for the amber grades. A good quality of sage honey is selling for 9½ to 13 cents per pound wholesale Sept. 5.

When we consider what it costs us to produce honey it would appear, other things being equal, that we must produce approximately twice as much of the amber as of the white-graded honeys. The producers of sage honey might tell us that, in order to break even this season, their bees must yield 120 pounds per colony. The alfalfa producers would then demand two cases to the colony; but, as a matter of fact, the yield is going to be about one-fourth that amount. The alfalfa producers have lost money. What are they going to do? Sell their bees? No, they are not going to do this. In the first place, there is no market for bees, and yet most of the beekeepers have confidence in the future. Some believe that by means of a co-operative honey exchange, properly handled, they will get a better value for their product. (They are certainly right in this belief, and it is to be hoped that concerted action will be brought about in this respect.) Others have the feeling that migratory beekeeping will better their conditions; while still others feel that they will do better by practicing better beekeeping generally.

Our best beekeepers know that honey cannot be produced this year for a cost of six cents per pound. The market and the season are variable factors. Good beekeeping practices mean a very great deal—they may mean a doubling of the crop; and, as important as they are, the beekeepers must also know what their honey is costing them to produce.

Altho the honey market is variable, due to supply and demand, etc., beekeepers nevertheless can exercise a very beneficial influence thereon. The logical method is for a co-operative honey exchange to market the honey, as by this means a better method of distribution is brought about and the cost of marketing is much more economically handled. The worth of a co-operative organization to beekeepers is dependent on the board of directors, and it is the duty of each and every member to see to it that five or seven of the best men among them, regardless of popularity, are selected to the directorate. It is likewise necessary for the members so selected to serve to the best of their ability, and not plead that they are preoccupied along other lines. To recapitulate, we must ever attempt to improve our beekeeping practices, keeping a close watch all the while on our maintenance and operating costs. Increased production, a lowering of cost, and marketing co-operatively are three serious considerations pertaining to our industry. Let us give them a very large part of our time. M. C. Richter.

Modesto, Calif.

* * *

In Southern California. Again I am spending a month in the Sierra Nevada Mountains, miles away from the sound of automobile horn or telephone bell. The fishing is still good in many of the mountain streams, and the many-colored leaves on the mountain sides make a most beautiful picture.

We came by what is known as the Coast Route, which brought us thru some of California's most productive honey territory. It is only in a very few localities that anything like a satisfactory crop was produced.

The Imperial Valley did not get as good a crop as was at first supposed, unfavorable weather being one of the principal reasons.

Prices are firmer, and considerable honey has been moving, but there is nothing in particular to get excited about.

The bees are in only fair condition, and many beekeepers will find it to their advantage to feed some of the lighter colonies.

Riverside County is putting on quite an exhibit at the State Fair. Among the interesting features will be a date tree with 1,000 pounds of dates on it. The beekeepers are also putting up quite a fine display. C. B. Baxter of Corona has been sent by the Riverside County Club to place the exhibit, and also to talk bees and honey to the visitors of the Fair. L. L. Andrews.

Corona, Calif.

* * *

In Texas.—The present condition of bees in Texas is just about normal, and the bee plants are in practically the same condition. While it is extremely hot and dry, it is the normal condition of this part of the world at this time of year. The majority of the colonies stored a fine supply of honey early in the summer, and where they were not extracted too closely are yet in fine shape. One of the things which is feared is that too many of the colonies have crowded brood-nests

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on account of the sudden flow which came before supers enough were given to the bees. This condition has existed, but it will affect only those yards which are not handled by well-informed beekeepers. Unless we have some rain within the next two weeks there will be no fall flow from broomweed or the sumacs, as these plants are now in poor condition; and, if their blooming is delayed by a lack of moisture, the honey flow will come too late for the bees. Some rain between now and the middle of September may induce a second blooming and some honey flow from the early spring plants, such as catsclaw, huajilla, and mesquite. The cotton section of the State has not produced a very abundant flow, because of the ravages of the boll-weevil and the dry weather. What the fall flow will be from cotton depends on rain between now and the middle of September.

Lloyd R. Watson, apiculturist at the Texas Experiment Station, has just put into operation one of the most unique pieces of apparatus ever used in bee investigations. This instrument consists of a 500-pound capacity Toledo automatic scale, to which is attached an automatic register controlled by an eight-day clock. This scale is so sensitive that 250 bees leaving the hive will cause a movement of 1-32nd of an inch in the line on the record sheet. To one who is accustomed to watching bees, it is very easy to interpret the action of the bees just by observing one of these records, as the flight of the bees in the early morning, the beginning of the storage of honey, the slacking away of work during the heat of the day, the return of the bees from the field at night, and the evaporation of honey during the night are all plainly shown. Mr. Watson and Dr. Tanquary, Chief of Division of Entomology, are very enthusiastic over this scale and believe that it will give some very important information on bee behavior within the next two or three years.

The United States census report gives Texas first place in the number of colonies of bees owned on the farms, with 235,111 colonies, and ranking second in the amount of honey produced, having 5,026,095 pounds to her credit. She also ranks second in wax production, having produced 93,822 pounds. This gives the State an average production of 21 pounds per colony which is 62% gain over 1909. While Texas decreased in the number of colonies of bees 1.3%, she increased in honey production 62.5%. This is due very largely to the work of the Extension and Experiment Station and of the bee journals. Beekeepers learned thru these agencies to use modern methods and to requeen annually.

It was very fortunate for the beekeepers of the State that Bexar County saw fit to elect E. G. LeStourgeon as one of its legislators. The foul brood and experimental apiary appropriation was saved thru his efforts, and an additional $4,000 was appropriated to augment the foul brood inspection work.

The beekeepers of the United States who are members of associations would be much interested in reading a bulletin sent out by the Aberdeenshire - Kincardineshire Beekeepers' Association of Scotland. This is a pamphlet of 75 pages of printed material and 50 pages of advertisements. This beekeepers' association started in 1910 with only 95 members and in 1920 possessed 1640 members. The annual dues to the association are 60 cents. This association maintains its own paid inspectors, does its own extension work, and maintains its own honey and bee exhibit every fall. The association is divided up into sections and each section has its own secretary.

San Antonio, Tex. H. B. Parks.

* * *

In Michigan.—Honey is being sold locally as never before. The demand for retail glass and tin packages is said to be the greatest ever. This surely is a very desirable condition of the industry and one that has long been desired. Probably not more than from 10 to 15 per cent of the Michigan honey crop ever goes into the wholesale markets. The lower that percentage can be reduced, the greater will be the beekeepers' prosperity.

The above paragraph is written with the supposition that the producers retail their honey at retail prices and not at wholesale prices. The facts are that many are retailing their honey at less than a reasonable wholesale price. Fortunately this is not being done by a large number, but unfortunately at least one such person seems to be present in nearly every county. The probable reason is that some have more honey this year than they ever dreamed that they would produce; others are terribly frightened by the falling prices and are trying to unload before the price gets still lower. It is unfortunate that producers do not make a closer study of economic and market conditions. Our greatest financial experts say that when prices do stabilize, they will be about 60% above pre-war levels. They also say that the bottom has been reached in foods. If these two statements are true, then some of our producers are going to find themselves in a rather embarrassing position a little later on. They are now retailing at pre-war prices. They are giving their customers to understand that they can continue to buy at the same price or less. If prices stabilize within the next year or two at the level indicated above, then there

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will have to be some pretty difficult explaining done by some beekeepers when they do finally attempt to get the market price for their product; or they will continue to do business at a loss and make themselves a nuisance in the business, as they are now. Better not cut prices too far; it is easier to lower the price later, if conditions indicate it, rather than to have to try to raise the price after having established a lower level. The public accepts the cut in price with smiles, but when the price has to be raised then often frowns and the loss of customers are the result.

The fall flow has been the best ever. Every part of the State has been blessed with an unusually heavy flow of nectar from goldenrod and other fall flowers. Yields of as high as 150 pounds per colony have been reported, but such are doubtless unusual. It is likely, however, that good colonies have stored an average of from 40 to 50 pounds. The fall flow is much earlier than usual. The honey is being thoroly ripened and should make first-class winter stores. However, many have learned by long experience that the fall honey is never as good as the white summer honey. It may, therefore, be well to supplement the fall honey with a feed of 10 pounds or so of granulated sugar syrup, in order to be sure that the bees may have a pure food, at least during the fore part of the winter.

Excepting the doubt that may be experienced regarding the fitness of the fall honey for winter use, the conditions in the colonies seem to be excellent for wintering. Heavy brood-rearing is going on all over the State. An increasingly large number of persons have requeened many of their colonies during July and August. Nature has made all the provisions she can for good wintering—now it's up to the beekeeper to give the bees the protection they need.

East Lansing, Mich. B. F. Kindig.

* * *

In Ontario.—At beekeepers' conventions and other places where the members of the craft happen to assemble, one often hears the expression, "We had a most peculiar season." There is no question in my mind but that the reason for this expression being heard so often is because the business is so uncertain and subject to so many factors, such as seasonal and climatic conditions. This year has been no exception, and it can be truly said that here at least, we "had a most peculiar season." After nearly 20 years of commercial beekeeping (and by that I mean during the time we have made our living from the bees), never before in all this time have we had a light clover flow all thru August, and never before have we had any swarming to speak of. In fact, a swarm in August was almost an unheard-of happening in this section.

This year the second crop of sweet clover bloomed during most of August and gave a light honey flow. Alsike clover, seeded in the spring, came up after wheat was cut and bloomed freely—in fact, is still blooming at this date (Sept. 9). The long-continued light honey flow caused swarming at two yards, and on Aug. 25 when I went to one of these apiaries I found five large swarms hanging in the apple trees there. Seemingly they were loath to go and find a home in the trees at that late date in the season, as the limbs they were clustered on had wax plastered on them, showing that they had been there for a day or so. I had been at the yard four days previous, so they had swarmed during that time. Colonies have an abundance of bees and brood—in fact, too much to allow us to feed very early for winter this year.

Market conditions have changed but little since last month's report. While prices are about the same, wholesale and retail men say that there is a great lot of honey moving for table use at present. In fact, they think that more is being used than at any previous time. Fruit is rather scarce and not any too cheap, while honey is cheaper and of good quality this year. These factors undoubtedly help to cause the great demand that Ontario is now experiencing.

The Ontario Beekeepers' Association has a very fine exhibit at the Canadian National Exhibition now being held in Toronto. Those in charge report heavy sales of honey at the booth, as they saw fit to pay for a concession allowing them to sell, anticipating that there would be a big call for the honey. Results have justified paying this rental, as they will dispose of enough honey to have profits to well nigh cover the expenses of the exhibit.

This annual exhibition, with an attendance running over a million each year, is possibly the best advertising medium that can be secured to bring the merits of honey before the people. While there, it was my pleasure to meet Mr. Spaulding, who is in charge of The Root Company's exhibit in the same building with the honey. A continual group in front of the Root exhibit testified to the fact that the public were interested in the educational features that made up a big part of this display.

While we have a big crop in Ontario as a whole, and while prices have dropped, yet after all we have much to be thankful for, as honey has not dropped as much as certain farm products. If cheaper containers and supplies were in sight, no one would complain about how soon we got back to normal.

An event of a few days ago that causes

much merriment when mentioned in the family, but which, by the way, was rather serious at the time of staging for the act, is possibly worth recording for the benefit of others who do things in a hurry sometimes and then have to repent at leisure, as is the case very often with me.

Our Jersey cow has been tethered in a meadow just south of the apple orchard, and, while grass there is luxuriant, her taste for apples has led to much trouble, as she will persist in breaking from her moorings and gorging herself with apples at every opportunity. One day last week I happened to glance over to the orchard, and noticed that she had broken loose and gone into the orchard again. She was still attached to a 20-foot chain fastened to her halter, and on the end of the chain there was a 9-foot post which she could drag along, after training, with as much ease as tho it was a match instead of a heavy post. I was busy, the day was hot, and I was out of patience with the cow and her actions; so I promptly started in double-quick time to remove her from the orchard and at the same time administer some corporal punishment. I do not know whether the bovine species in general understand telepathy or not; but one thing sure, that particular member of the tribe understood what was in my mind, for long before I got to her she started to run towards a melon patch some 200 feet away and some 88 colonies of bees adjacent to the melon patch. I started to get ahead of her, but she outran me. My first concern was about the melons; but when she made a straight drive thru them, slashing melons as she went with the dragging post and making no signs of a halt as she got near the bees, I soon forgot about the melons. She made a straight run down between two rows of bees with 25 colonies in each row, and then halted at the end before a board fence. With 20 feet of chain and a big post at the far end, I mentally began to compute what was going to happen when she made a right-angled turn between the hives in either row. But she suddenly decided to turn right about face and go back, seeing no opening at the end of the road she was traveling. She made the return trip safely to the end of the row, and then suddenly turned off sharply as she got out from between the rows. The flying post caught squarely the last hive in the north row, sending the super about five feet in the air and turning the brood-chamber upside down. The post stalled against an obstruction and held the cow—but only temporarily.

In an instant the air was filled with bees trying to find the cause of the wreck of their home. Incidentally I might say they found the "cause" in a hurry, as cow and her owner can testify. She has been fighting flies all summer, but this brand seemed to surprise her, for she gave one snort and with a heave loosened the stalled post and started to go again. We are all familiar with the famed cow of nursery rhyme that jumped over the moon; and, while the moon was not in evidence just then, I am fully convinced that under the circumstances she would have tried to jump over it if given an opportunity. She promptly negotiated a row of packing cases, going right over them, and then cleared at a bound or two the peak of the roof over the bee-cellar. The post stalled on the opposite side of the cave, and as soon as possible I unloosed the snap from her halter, when with tail over her back she made off as fast as possible from the scene of her frolic.

This happened at the time of a honey dearth, and I was afraid of a bad robbing spree if I did not get the hive fixed up soon; so without hat or veil, and covered with perspiration I righted the hive and put the super back on. Needless to say I got a fearful stinging, my head in particular being filled with their daggers. The morals to be taken from this story are obvious. Some which might be mentioned are these: If cows or other animals are tethered near the bees, see that thy cannot get loose. If they do get loose and you have notions of reproving them in a forcible way, be sure you have hold of the cow before you let her know your intentions. As to the stinging, I had a headache for an hour or two. Aside from that there were no particular symptoms noticed as directly caused by the stings, altho I suspect the good wife might say that I was a bit crankier than usual for the next few hours.

Markham, Ont. J. L. Byer.

* * *

In North Carolina.—Honey production is far below normal this year thruout North Carolina. Some apiaries in the northeastern section of the State near the Dismal Swamp report fair yields, one apiary producing an average of 44 pounds of comb honey per hive, making over two tons of comb honey from this apiary. Others in the same section report yields that compare very favorably with this good record for a very indifferent honey year.

The flow of honey in the central and upper Piedmont sections of the State was very light. Only those who practiced really good beekeeping methods obtained anything like a creditable surplus crop. Crimson clover increased the yield in many localities. In fact there are reports from localities where clovers were available for the bees that showed 100 pounds or more per colony, that is for individual colonies. The

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average yield, of course, was considerably under this high record for the season.

The cotton blossoms yielded nectar quite freely in many of the central and Piedmont sections of the State, some beekeepers reporting as much as 30 to 40 pounds of surplus from individual colonies from the cotton bloom.

Reports show that in the mountain sections of the State the flow was far below normal, as it was also in the coastal section. One mountain apiary of 54 colonies reports 1700 pounds of honey, about one-third of a normal yield. Thru all the mountain region the honey flow was light, only those who practiced the best methods of beekeeping getting any surplus honey at all.

Estimates by those in best position to judge indicate that about 40 per cent of a normal honey crop is being realized by the North Carolina beekeepers. Fall flowers in many sections are yielding considerable nectar, but this may be cut some by widespread dry weather prevailing in many sections recently.

In spite of the serious handicap of heavy curtailment in honey yield beekeepers in various sections are making their preparations for the annual honey and bee products display at the State Fair in Raleigh during the week of October 17-22. There are cash prizes aggregating upwards of $150, including first, second, and third awards for various types of honey and bee products. R. W. Etheredge of Goldsboro is again director for the bee and honey exhibits, and C. L. Sams, North Carolina bee specialist, is the superintendent for the 1921 display. Last year this division was really one of the sensational developments of the State Fair from the viewpoint of increased proportions and improved individual exhibits, one beekeeper alone having installed an exhibit larger, as well as finer, than the entire bee and honey exhibits in previous fairs.

This year, of course, honey, both as to types and quantity, is much scarcer, but several of the larger beekeepers are preparing to go to the fair with the most creditable showings possible, and the management of this division of the big show are very sanguine of scoring another decided success.

In spite of the poor honey profits this season many beekeepers are practicing improved methods. They are requeening and otherwise improving their colonies in preparation for a possible bumper crop of honey next spring. Many beekeepers, who have persisted in keeping bees in old gums or box hives, have at least made a start in getting them into improved hives, even tho in some cases they have made their own hives, buying only the Hoffman frames and foundation to give their bees the new start desired. The well-directed efforts of State Bee Specialist C. L. Sams and the co-operation of the State Beekeepers' Association, headed by Bruce Anderson of Terra Ceia as president, are piling up evidence of the effectiveness of persistent and well-directed effort for better beekeeping.

Wilmington, N. C. W. J. Martin.

In Lousiana.—The State of Louisiana is now coming into her own as the land of the honeybee, and this is being brought about by boys and girls who are members of the bee clubs and are raising bees according to the most up-to-date methods. There are at present more than 350 members who are doing work under the supervision of E. C. Davis, bee specialist, Louisiana State University.

It was the pleasure of the 605 boys and girls attending the eighth annual boys and girls' short course at the Louisiana State University, July 28 to August 3, to hear E. R. Root give a talk along the line of the work he loves so well.

While there was only a small percentage of the club members present doing bee-club work, it is an assured fact that all of them returned home with the desire planted in their hearts to secure as soon as possible at least one hive of bees and next year to become a member of the bee club.

In his talk Mr. Root told how greatly he was impressed with Louisiana as a future bee State. He said that every day he was learning to change his ideas and opinions as to just what is the best section of the United States to keep bees. In one of his books he stated that white clover honey is never produced in any large quantities in the South, but coming to Louisiana he finds that this clover is one of the most valuable honey-producing plants the State has.

He congratulated the bee-club members on the fact that so many of them are keeping bees in a scientific manner, and said while he had come South to speak to adult beekeepers who were holding their meeting at the same time, it was worth the trip to speak to children who knew so much about the honeybee.

A parade of all the club children was held, each member marching behind a float representative of the work being undertaken. Mr. Davis decorated a float in an attractive manner, placed a number of the girl members upon it, and labeled it "A Carload of Honey." The others marched behind bearing banners, upon one of which was printed, "Governor Parker was Once a Beekeeper."

Baton Rouge, La. Bentley B. Mackay.

HEADS OF GRAIN FROM DIFFERENT FIELDS

Honey Granulates Soon After Extracting. There is something peculiar about honey here. As soon as it was extracted it commenced to candy even when kept in a very warm place, while honey left in combs kept in the attic where it was very cold did not candy. Even the unsealed cells are liquid. The honey that was cut off in the uncapping does not granulate as long as it remained with the cappings; but, as soon as it was separated it began candying. Isn't this strange? Some years our honey does not candy at all. A. W. Lindsay.

Detroit, Mich.

◆

Excessive Swarming in August. Here it is the last week in August, and our "home yard" of bees is just now breaking a June swarming record. We have had from two to five swarms a week now for the past three weeks. Young queens, extracting from the upper stories, and plenty of extracting room given by tiering up do not quell it. New swarms with young queens swarm again in two weeks after hiving. Our only explanation of this mania is that a very large acreage of cowpeas is in close proximity to our yard. Our Monroeville yards, as also our Atlantic County yards near Mays Landing, are doing only a normal fall gathering of nectar. C. L. Hill.

Pennsgrove, N. J.

◆

Do Poor Seasons Follow an Early Spring? J. E. Crane of Middlebury, Vt., in July Gleanings states that spring opened unusually early, and that alsike clover was blooming June 1 when only a few inches high. He goes on to state that we rarely or never get a good honey season following an early spring. Well, those same conditions prevailed here in Knowlton—very little rain in May, less in June, and for the last three weeks not one-fourth inch has fallen; but during every day for more than two weeks strong colonies have stored on an average just about 10 pounds a day, mostly from white clover. I now have 2,500 pounds of as nice honey as I ever saw extracted, with at least twice that amount still in the supers, and during every day for the last weeks the mercury has stood at 90° or better in the shade. I have done some hustling, as well as some sweating, but it's no use—the bees are well ahead of the game, as lots of the supers are crowded with honey. This is true not only of the supers but of the brood-chambers as well, and the consequence is that colonies in that condition are swarming galore. I have kept bees for more than 40 years, but the last three weeks beat the record for honey. I am wondering if the same conditions prevail at Middlebury, Vt., which is not more than 70 miles south of here. If so, Mr. Crane must be most happily disappointed this time. J. Raymond Ball.

Knowlton, Quebec.

◆

Packing the Hive-stand. The accompanying illustration shows a simple and effective plan for bottom packing. A partition is placed across the hive-stand so that it will come just under the front end of the hive-bottom, and a piece of galvanized wire netting is stapled over the bottom of the hive-stand. The stand is then ready to be filled with packing. The hive will keep the packing dry, which would not be the case if the packing extended under the alighting-board. In case the packing should get wet it will speedily dry because of the netting, which will also keep out the mice. The packing can be left permanently.

Hive-stand arranged for bottom packing.

Brookhaven, L. I., N. Y. E. M. Barteau.

◆

New Era in Beekeeping in Western Washington. The biggest handicap to beekeeping here is foul brood. Both American and European are to be found everywhere, and until more funds are forthcoming from the State to cover adequate inspection and education it will continue to spread. The greater portion of bees are kept by farmers in box hives, and no attempt to care for them other than "robbing them" is made; while here and there is a "bee master" fighting the great odds to hold his own.

Fruit bloom and white clover which generally yield us considerable surplus are a complete failure this year on account of continued rains; but most of us are putting our hopes in a good fireweed flow, altho many tell me it will take the most of their flow to put their bees in condition for winter. But in spite of these great discouragements we are looking forward to a new era of beekeeping in western Washington, for to us it is truly the "land of milk and honey." J. G. Neeley.

Olympia, Wash.

GLEANED BY ASKING

Geo. S. Demuth

QUESTION.—Is the skin of peaches originally broken or punctured by some other agency when bees work on them?
D. A. Moran.
Pennsylvania.

Answer.—Yes. The bees are unable to puncture the skin of sound fruit but work on it only after the skin has been punctured by some other agent or becomes broken because of being overripe or because of some fungus disease.

WINTERING DISEASED COLONIES.

Question.—Would you advise treating colonies having American foul brood this fall or would they probably last until another honey flow?
Kentucky. Thomas Kennedy.

Answer.—By all means the colonies should be treated this fall. Disease is spread about every year by attempting to winter colonies having American foul brood. If the colony has been greatly weakened it is almost sure to die, and the bees from other colonies rob out the honey that remains, thus carrying the infection to other colonies. If you have some combs filled with honey you can treat diseased colonies, after brood-rearing has ceased, by shaking them from their combs into an empty hive, leaving them a few hours, and then giving the combs filled with honey. The combs from which the bees were shaken should, of course, be destroyed as soon as free of bees.

TRANSFERRING IN THE FALL.

Question.—Is it too late to transfer a colony of bees from a prostrate tree trunk to a hive?
New York. Charles E. Robbins.

Answer.—You can transfer the bees even this late provided you have combs of honey on which to hive the bees when you take them out of the log. It will be better, however, to leave the bees in the log until spring before transferring. You can saw off that portion of the log which contains the colony and take it home for winter.

BLEACHING TRAVEL-STAINED COMB HONEY.

Question.—How can I bleach travel-stained comb honey so it will be white? Mrs. A. K. Bradley.
Wisconsin.

Answer.—You can improve the appearance of travel-stained honey by placing the sections in a window in direct sunlight for several days, but the stains cannot be bleached out completely. Some travel-stain will bleach but little even when exposed to the sun for a long time.

WRAPPING HIVES IN BUILDING PAPER FOR WINTER.

Question.—Will a good grade of roofing paper wrapped around the hives give ample protection for winter? T. J. Hughs.
Texas.

Answer.—Roofing paper wrapped around the hives without any packing material between does not add materially to the thickness of the hive walls and therefore cannot be of much value in preventing the escape of heat thru the walls of the hive. If there are cracks in the hive or between the cover and the hive-body that are not filled with propolis, the paper would, no doubt, be of considerable benefit in preventing the escape of warm air thru the cracks; but, if the cracks are well filled with propolis, the paper would be of no benefit in this respect. The greatest influence the building paper can have is thru its color. The black paper would absorb more heat from the sun than the surface of a hive painted white. While this may be beneficial in some cases, a violent warming up of the hive every day the sun shines, may cause the bees to be too active. It would be better to put packing material between the paper and the hive.

HONEY STORED JUST BEFORE COLONY BECOMES DISEASED.

Question.—I have a super full of honey that was stored and sealed before the colony contracted American foul brood. It is still on the hive but separated from the brood-chamber by two shallow extracting supers. I need this honey for stores. Will I run a great risk by using it?
Ohio. Dorothy Lewis.

Answer.—It would not be at all safe to use this honey to supply stores for your other colonies. No doubt this disease was present in the hive for some time before you discovered it, and there may be plenty of spores of this disease in the honey now stored in the super.

WINTERING IN TWO STORIES.

Question.—Will it be all right to pack my bees just as they are with a full-length super of honey on top and leave them packed until late next spring to save labor? N. H. Wilson.
Vermont.

Answer.—You will, no doubt, be pleased with the results of wintering your bees in two stories provided you give them sufficient protection. The only objection to this plan is that of the increased amount of room in the hive during the winter, but you can overcome this to some extent by increasing the thickness of the packing. When colonies are prepared for winter in this manner they should need no further attention until just before your main honey flow next season.

QUEENLESS COLONIES FOR WINTER.

Question.—What can I do with a colony that has been queenless all summer? It seems to have lots of bees. Jennie Ballinger.
Ohio.

Answer.—If the colony has been queenless all summer there is nothing you can do now to make a good colony out of it, because the bees are all too old to survive the winter and it is now too late for them to rear enough bees to make a winter colony, even if you were to give them a laying queen. Are you quite sure that this colony is queenless? Or are you assuming that they are queenless because you do not find brood in the hive at this time? Colonies that have been queenless all summer would not have many bees left in the hive, for most of them would have died of old age by this time. If your colony has really been queenless for a long time, you may as well unite it with some colony that needs more stores. The bees are of no value.

BEES TEARING OUT BROOD.

Question.—Why do my bees uncap the brood-cells and kill the young larvae, both drones and workers? S. S. Wilson.
Mississippi.

Answer.—No doubt your colonies were threatened with starvation at the time you saw them uncapping some of the brood and dragging out the immature young. During cool nights in early spring or late in the fall it sometimes happens that some of the brood is chilled, in which case the bees will carry out the chilled larvae or pupae. In the fall just at the close of brood-rearing, bees often neglect some of the brood in more remote portions of the hive when they first form a cluster, leaving portions of the brood outside.

STRANGE ODOR IN APIARY.

Question.—What causes the peculiar odor about my hives? It does not smell like foul brood altho I can smell it 20 feet away. D. D. Houghton.
Ohio.

Answer.—The odor which you notice is, no doubt, from the ripening of nectar gathered from fall flowers. Sometimes when bees are working on fall flowers the odor given off while ripening the nectar can be detected a considerable distance from the apiary.

SWARMING OUT WHEN WELL SUPPLIED WITH HONEY.

Question.—Why should my bees swarm out in August, deserting their hive and 20 pounds of honey? O. A. James.
South Dakota.

Answer.—Bees will swarm out and desert the hive even when they have plenty of honey, if badly infected with American foul brood. It will be well for you to examine the combs to see if they contain evidences of this disease. If you are unable to recognize American foul brood by an examination, it will be well to send a sample of comb containing dead larvae and pupae to Dr. E. F. Phillips, Bureau of Entomology, Washington, D. C., for examination.

WHY NOT PACK EARLIER?

Question.—In the literature I have read, I don't see any advocacy of early packing and would like to know what is the objection, if any.
New Hampshire. R. G. Ring.

Answer.—There is no objection to packing the bees early provided you can have a large entrance until the arrival of colder weather. Some prefer to pack their colonies in September, tho most beekeepers prefer to do this early in October. In some cases the packing is built in as in double-walled hives, so that the bees are really packed all summer but the entrances are enlarged during the summer.

USING EXTRACTING COMBS FROM DISEASED COLONIES.

Question.—Would it be safe to extract the honey and use the combs again that were taken from a colony having American foul brood but above a queen-excluder? Harrison Robertson.
Kentucky.

Answer.—It would not be safe to use these combs again. The queen-excluder does not prevent honey from being carried above after having been stored below temporarily. The honey in these combs could easily be a source of infection, even tho no brood has been reared in them.

SAWDUST OR FOREST LEAVES FOR WINTER PACKING.

Question.—Is sawdust just as good for packing bees for winter as forest leaves? C. H. Gebhardt.
Wisconsin.

Answer.—There is probably but little difference in insulating value between sawdust and forest leaves. Sawdust is more inclined to absorb moisture than forest leaves, if the winter case is not properly constructed. Some beekeepers prefer a mixture of sawdust and planer shavings. When forest leaves are used they should be crushed as fine as possible, so that the packing is not too loose.

STORING COMBS OF HONEY DURING WINTER.

Question.—What is the best way to store combs of honey during the winter to be given to the bees in the spring? J. E. Fenton.
Michigan.

Answer.—The combs of honey should be stored, if possible, in a warm room where the temperature does not run below freezing. If a heated room is not available the combs may be stored in a basement, preferably near the furnace. If they are stored in a cold room there is danger of the honey granulating during the winter. Combs of honey should never be stored in a cellar that is very damp, for in this case it would absorb moisture from the air and might become so thin that it would sour. A closet adjacent to a chimney would be an ideal place to keep combs of honey, especially if the supers of honey can be piled against a chimney that is warm all winter.

MOVING BEES SHORT DISTANCES.

Question.—How can I move my bees a short distance (15 to 60 feet) in order to have them in groups of four to pack in quadruple winter cases?
Connecticut. Harry S. Ferry.

Answer.—You can move the bees a few feet each day that they fly freely until they are finally where you want them. You can even turn some of them around to face in the opposite direction by turning them a little each day. When the hives are so far apart as yours are, they can be moved from three to five feet at a time, if there are no trees or other objects to help the bees locate their old position. Another way to do this is to move the bees to another location several miles away, leaving them there for a couple of weeks, after which they can be brought back and placed where desired. In the meantime the bees will have forgotten their former location and will mark their new location when released.

TALKS TO BEGINNERS

Geo. S. Demuth

THOSE who have followed these talks and who have acted on the advice given in August and September in regard to leaving plenty of honey in the hives after the middle of August (not less than 15 or 20 pounds) and having a good queen, preferably young, should now have their colonies in good condition for winter so far as young bees are concerned. But if on account of a poor queen, queenlessness, not enough bees, or a lack of stores, any colonies have failed to rear young bees during the past six weeks, these colonies are in a poor condition for winter and it is now too late to retrieve the situation. Even if several such colonies were united they would still be made up largely of old bees, most of which would probably die of old age before midwinter.

Thruout a large portion of the country, especially in the northeastern part, there has been a fair fall honey flow. This has stimulated brood-rearing in September, so that there are plenty of young bees now, even in colonies having old queens or having but little honey. In some localities late brood-rearing has been excessive, many colonies having seven or eight frames of brood, the rearing of which caused them to use a large amount of stores. In such cases the colonies are in excellent condition so far as young bees are concerned, but they may have used up so much of their honey that it will be necessary to feed them for winter.

In some localities where the fall honey flow was abundant many colonies swarmed late in August or early in September, thus complicating the problems of the beginner and lessening the chances of good wintering. In the case of colonies which swarmed in August and were prevented from sending out after-swarms, both the swarm and the parent colony, especially the latter, may build up strong enough for winter if conditions are favorable. But in this case there are two queens laying eggs instead of one, and two large families of young bees being reared as well as two colonies to be supplied with stores for winter and spring, so that unless the fall honey flow has been heavy such colonies may need to be fed for winter. If after-swarming was not prevented and the original colony divided itself up into three or four small colonies late in August or during September, these should be reunited to form one good colony, as described last month.

Suspension of Brood-Rearing During Winter.

Thruout the North the bees usually cease rearing brood entirely early in October and begin their long winter rest. If all goes well during the winter they will not begin brood-rearing again until March; but, if the winter is severe and the bees age rapidly because of poor stores, lack of protection, or lack of numbers to keep up the warmth of the hive, they may begin to rear brood again in February or even in January. In the South brood-rearing is continued until later in the fall and is begun earlier in the spring, thus making the period of rest shorter. Other things being equal, the better the bees are wintering, the longer they will refrain from brood-rearing.

If the bees lived only as long in winter, as they do when quite active in summer (six to eight weeks), it would not be possible for the colony to survive. But by remaining quiet they are able to prolong their lives four or five times as long, thus enabling the colony to survive until brood-rearing can safely be resumed in the spring. Bees do not hibernate in winter, as do many other insects, but when conditions are favorable they remain almost motionless for long periods, living so slowly that they do not age materially until they become more active in the spring.

Formation of Winter Cluster.

On cool mornings when the temperature outside is near freezing, the bees will leave the remote parts of the hive and form a cluster. If the hive is single-walled this tendency to form a cluster is more marked than if the hive is double-walled. The size of the winter cluster depends upon the temperature of the hive as well as upon the number of bees which form it, the cluster being smaller when the temperature is lower.

The winter cluster should occupy at least five or six of the spaces between the combs when the temperature outside is near freezing, tho it must be remembered that a small cluster of young bees may be better able to withstand the winter than a large cluster of old bees. When the bees have worked late in the season on late-blooming flowers, almost all the older bees may have worn themselves out and have disappeared from the hives, leaving chiefly the young bees at this time, while if they have been idle many of the old bees may still be present.

When the hive becomes so cold that a compact cluster is formed, it is located on that portion of the comb having empty cells, this being where the last of the brood emerged. If the colony has plenty of honey the cluster will be formed toward the front of the hive near the entrance, since the honey was stored above and back of the brood; while, if there is less honey, the cluster will be located higher and farther back in the hive. In the double-walled or any well-packed hive the cluster will extend out over the honey, in some cases nearly filling the brood-chamber even on cool mornings.

It is usually better to unite colonies which do not occupy at least five or six spaces between combs, tho small colonies can be wintered by reducing the brood-chamber to fit the cluster. This can be done by taking out the combs not occupied by bees and filling this space either with chaff division-boards or a tight-fitting board with packing material, such as dry leaves, sawdust, or planer shavings, filled in the space back of it. The cluster of bees should touch the sides of the hive on cool mornings in October, and by reducing the size of the brood-chamber even small colonies can be made to do this; but, of course, it is much better to have larger clusters so there is no need of reducing the space in the hive.

Winter Stores.

In addition to having plenty of young bees to form a good-sized winter cluster each colony should have plenty of good honey sufficient to last them not only thru the winter but also for their early spring needs. To determine how much honey is in the hive weigh an empty hive without frames, add 10 pounds for the weight of the 10 frames and comb and about five pounds more for the weight of the bees and some pollen. Knowing the weight of the hive, combs, and bees, the weight of the honey can be easily determined by weighing the hives containing the colonies. If platform scales are not available for this purpose the weight can be determined near enough by ordinary spring scales, weighing one end of the hive at a time by hooking under the end of the hive-bottom and lifting up just enough so that it will clear the hive-stand. Add the two weights thus secured together. This sum is about the total weight of the hive, bees, combs, and honey. After subtracting the weight of the hive, combs, and bees there should be a difference of from 30 to 40 pounds for the honey. If there is less than 30 pounds, more stores should be given early this month. If frames of honey are not available for this purpose, the bees should be fed a syrup made of two or two and one-half parts of granulated sugar to one part of water.

To make the syrup, first heat the water to the boiling point, then add the sugar, stirring it until the crystals are dissolved. To reduce the tendency of this heavy syrup to crystallize in the combs a teaspoonful of tartaric acid for each 15 or 20 pounds of sugar used should be dissolved in a little water and added to the syrup. When this is done the syrup should again be heated to the boiling point, or nearly so, to hasten the action of the acid. If the syrup is not made heavier than two parts of sugar to one part of water and the colonies are strong, especially if they are packed for winter before feeding, the acid may not be necessary, since under these conditions the bees will modify the syrup as they store it, reducing the tendency to crystallize.

The syrup can be fed to the bees in 10-pound honey pails having perforated lids, about 100 small holes being punched in the lid by means of a small nail. When the syrup has cooled enough so it does not burn the hands the pail, filled with the warm syrup and the lid in place, should be inverted and placed directly on top of the brood-combs in an empty hive-body or above an escape-board having the bee-escape removed, the pail being placed directly over the hole in the escape-board. In the latter case a little syrup should be poured into the hole in the escape-board to start the bees to work promptly. The bees will take the syrup thru the holes in the lid, but the syrup can not run out if the holes are small, being held by atmospheric pressure. The space in the upper story around the feeder should be packed with old clothes, burlap, or planer shavings, to keep the syrup warm until the bees have had time to carry it down.

Winter Protection.

The final requirement for winter is that of protection. While in exceptional cases bees may be wintered out of doors even in the northern States in the regular summer hives, it is not safe to attempt to winter them in this way. Farther south the bees may apparently winter well in single-walled hives during an occasional open winter such as last winter. For this reason beekeepers in the middle latitudes are too often tempted to leave their bees unprotected year after year, hoping that the winter will be mild. Except in the extreme South it pays well to provide some kind of protection for the hives in addition to that afforded by a single thickness of lumber. This may be given by the use of double-walled hives or by packing the regular single-walled hives in winter packing cases, as described elsewhere in this issue; or in the far North by carrying the hives into the cellar next month, to be left there until the latter part of March or early in April. One would naturally think that putting them in the cellar during cold weather would be the best way to winter the bees, but successful cellar wintering depends upon having so many things just right that the beginner will do well to winter his colonies outside unless located where the winters are extremely severe. Bees can be successfully wintered outside, if well protected, even in the most northern tier of states and parts of Canada. The hives should be packed on all sides and top with several inches of finely crushed forest leaves, dry sawdust, a mixture of sawdust and planer shavings, or some such material, avoiding coarse material such as straw or corn fodder. The entrance should be reduced during cold weather to about ⅜ inch by 2 inches.

JUST NEWS

Editors

THE total amount of honey imported into the United States during the fiscal year ending June 30, 1921, was 452,983 gallons, or over 5,000,000 pounds, according to figures recently given out by the Bureau of Markets and Crop Estimates, U. S. Department of Agriculture. In addition to these imports from foreign countries, large shipments were received from Porto Rico and Hawaii.

* * *

L. B. Crandall, bee specialist at Connecticut Agricultural College, calls the attention of beekeepers of his State to a public act of 1919 which requires all owners of bees to register before October with the town clerk the number of hives owned. Owners of bees who fail to register are liable to a fine of not more than $5.00. The records of bee registration are open to the public, and when complete registration is obtained Connecticut will have annual data on the bee industry as reliable as can be found anywhere.

* * *

The American Honey Producers' League has submitted the following news items:

The first of the League advertising appeared on page 141 in the September number of Good Housekeeping. The advertisements will be followed up by circular letters by the League to the retail and jobber trade. In addition to these recipe articles other articles of interest on beekeeping will appear in a large number of the home magazines. The epidemic of ordinances against beekeeping is still in evidence, and the League secretary aided by men prominent in beekeeping lines has been very successful in causing many cities to abandon these ordinances. Prof. H. F. Wilson is securing the promise of the more prominent speakers who attend the State Beekeepers' Association meetings that they will attend only those whose dates are on the schedule made by the committee headed by Prof. Wilson. This is a very important move, as it cuts down the travel and expense of the speakers, and at the same time makes it possible for States to obtain speakers which they could not have if their meetings were held at another time. In another year the League hopes to put out in full a schedule of dates to all speakers. The Kansas Honey Producers' League announces that it has completed its affiliation with the American Honey Producers' League. This was done under the leadership of Dr. J. H. Merrill. The Bureau of Markets of the United States Department of Agriculture already sees the value of the American Honey Producers' League. In the August 20th number of the Market Reporter occurs the following paragraph: "The American Honey Producers' League, which is a super organization of the beekeepers' associations of the country, has outlined plans for an increased advertising program during the fall and winter, and, considering the fruit shortage, honey may move at better prices by winter." The reward notices to be posted at apiaries have found favor with the beekeepers. Numbers of them have been sent out. Any beekeeper who is a member of a State Association that is affiliated with the League can secure these notices from the secretary by paying 10 cents each for printing and transportation.

* * *

The Northern Illinois and Southern Wisconsin Beekeepers' Association will hold a meeting in Memorial Hall in Rockford, Ill., on Thursday, Oct. 18, 1921. Beekeepers are requested to bring honey and bee fixtures for a small exhibit. B. Kennedy, 416 East State St., Rockford, Ill., is secretary

* * *

President J. W. Barney, of the Florida State Beekeepers' Association, announces that the second annual meeting of the association will be held at the University of Florida, Gainesville, on October 6 and 7; last year's meeting was also held at Gainesville and the attendance amounted to over 150 beekeepers. Altho it was the first meeting of the new organization, enthusiasm reached such a point that the sessions lasted far into the night, and all declared that the State Association was the one thing needed to put Florida beekeeping on its feet as one of the really worth-while industries of the State.

* * *

The September (1921) Monthly Crop Reporter, Bureau of Markets and Crop Estimates, United States Department of Agriculture, reports the average yield per colony to Sept. 1 for the United States as 40.5 pounds as against 51.9 for 1920 and against a five-year average of 40.4. The yield to Sept. 1 is estimated to be 87.4% of the total yield for the season. Among the States, Nevada is credited with 85 pounds per colony, Idaho and Wyoming 80 pounds per colony, these being the highest yields reported. While the yield for 1921 to Sept. 1 is only 78% of that of 1920, the number of colonies is greater, being 107.4%, so that the indicated production of honey to Sept. 1 this year is 84% as great as last year's yield. The condition of the colonies is reported 90.9% against 97.2% for 1920, and against a five-year average of 90.7%. The condition of the honey plants is reported to be 77%, as against 85.8% in 1920 and against a five-year average of 76.5%.

BEES, MEN AND THINGS

(You may find it here)

I HAVE tried to have some bees in the old-fashioned way, thinking to let them take care of themselves in old box hives, and never go about them until I wanted some honey, then get it and run; but I found out, after I read up, got some standard hives, and had my bees transferred, that there is but one right way in everything.''—Mel Swallow, Spencer County, Ind.

''I hope you can put in a good word at Washington for the beekeepers of this country in regard to a protective tariff on honey. We surely need a protective tariff on honey if we need tariff on anything.''—Gilman F. Egge, Minnehaha County, S. D.

''I wrote you last summer of having discovered the annual white sweet clover growing here in my garden, and of Prof. Hughes coming here and pronouncing it absolutely pure. We afterward found a considerable quantity growing near here.''—F. A. James, Hale County, Ala.

''I got for winter protection some corrugated paper boxes and set the hives in pairs. I covered the hives with this corrugated paper and covered this with tar paper. I believe the corrugated paper next to the hives is a good protection. I also had the hives well protected around the bottom. If a great number of hives are to be protected it would be quite a job to cover them this way, but I believe it would pay.''—A. L. Timblin, Douglas County, Nebr.

''In a poor season, like the last, when the clovers and other flowers, from which our lightest-colored honeys are obtained, do not yield much nectar, the bees have to go further afield and seek inferior sources of supply that would most likely be neglected in a good season. Catnip grows wild in some districts, and is responsible for much of this inferior honey. A very little nectar from this plant is sufficient to give a strong flavor of peppermint to the whole honey crop. —W. J. Sheppard, British Columbia.

''I saw the mating of a queen about 20 feet up in the air above a little cherry tree. There was a big bunch of drones and tho our bees are all Italians the great majority of this bunch were black. The queen and drone fell at my feet, and when free the queen flew straight toward a certain hive. The result is hybrids in this hive. This bunch of drones came from my neighbors' hives one to two miles away. That is why I buy all my queens.''—Stephen J. Harmeling, King County, Wash.

''Oscar Poe, who has 1400 stands of bees on farms between Chamberino, N. M., and Canutillo, Texas, reports that his first extracting this season yielded 50,000 pounds of high-grade honey. The Poe apiary is the largest in the Mesilla Valley, in which this year's output is estimated at from 200,000 to 255,000 pounds.''—August Wolf, Dona Ana County, N. M.

''I am of the opinion that many bees here in the State will starve the coming winter unless they are fed.''—A. E. Crandall, Hartford County, Conn.

''We have had a wonderful honey flow here this year, first from mesquite followed by a fine flow from cotton. My average per colony is 100 pounds.''—J. P. Caldwell, Coleman County, Texas.

''We are now getting the bees ready for winter, and taking the small amount of honey which they can really spare, and our crop may yet be one carload, if the west yards are, as usual, heavier than those east of here.''—E. F. Atwater, Meridian, Ida.

''I started my increase the first of July instead of August and they are in fine condition. With a Boardman feeder on each one the queens are filling the combs in with brood, as plenty of fresh pollen is coming in.''—W. T. Rabb, Travis County, Texas.

''We have had an excellent season for honey. During the clover flow in June and July beekeepers reported seldom seeing a bee working on either the white clover blossoms or on the alsike, yet they rolled in a large quantity of fine white honey.''—Harold A. Breisch, Schuylkill County, Penn.

''My present effort in beekeeping began four years ago when I was 79 years old, with old box hives. I now have five 10-frame Langstroth hives, 5 Danzenbaker, and 5 box hives. I have been an invalid for 22 years, but am in better health at present than during all these years, and am now past 83 years old.''—E. J. Howard, Henderson County, Ky.

''For a number of years I have contended that beekeepers cannot undersell the grocers and get away with it. The price honey is bringing today in the wholesale markets proves it. As long as beekeepers retail honey at half or less than half of what the grocers sell for, they must not complain that they are not getting enough for their honey. Cut prices will do two things: first, it will decrease consumption because the consumer will not buy from the stores after the cheap honey is gone, provided the cheap honey was satisfactory; second, at once it creates suspicion as to the purity of the honey.''—John C. Bull, Valparaiso, Ind.

OUR HOMES

A. I. ROOT

And they brought unto him all sick people that were taken with divers diseases . . . and those which were possessed with devils . . . and he healed them.—MATT. 4:24.

Be sober, be vigilant; because your adversary the devil, as a roaring lion, walketh about, seeking whom he may devour.—I. PETER 5:8.

Satan himself is [sometimes] transformed into an angel of light.—II. COR. 11:14.

And they come to Jesus, and see him that was possessed with the devil, and had the legion, sitting, and clothed, and in his right mind.—MARK 5:15.

THIS Home paper is to be a sequel to the one in the July number. In olden times we read of people being possessed of devils. In fact, there is more or less said about demoniacal possession thru all the four gospels. Skeptics and infidels have made sport of it; and I confess that, when I first began to "search the Scriptures," after the dear Lord had lifted me from the "sinking sand," one of my troubles was in regard to this same matter. However, I very wisely went to my good pastor, and told him I was specially troubled about the devils going into the swine. He looked at me smilingly and said:

"My dear friend, do you think you are the first one to be troubled in regard to this incident?"

"Why, Mr. Reed," said I, "have other folks felt about it as I do?"

He went to his library and took down a large volume entitled "Demoniacal Possession," and remarked that, if that big book was not sufficient, there were a number of other volumes on that subject. Then he advised me to let the matter drop until I had gone a little further in my religious life, and I am very glad he did so.

Well, dear friends, it has been impressing itself upon my mind for some years back that being possessed of a demon or demons is *not* entirely a thing of the past. It would seem that right now almost every daily paper has an account of one or more poor deluded men who have been shooting their wives or somebody else, and then turning the revolver on themselves. Every time I read such an account I say to myself, "This poor soul was either possessed of a devil or something very much like the devils spoken of in Holy Writ." It would seem that the poor culprit in his passion shoots his wife, or possibly his sweetheart, without really knowing or considering what he is doing; and just as soon as he realizes the extent of his awful crime he turns the weapon on himself and ends his own life. You may say the man is crazy. Well, if the matter be inquired into you will find the man or woman (or both) became crazy by *slow steps*. The devil first got hold of them in some way that seemed harmless and almost innocent; but step by step they were led on until chains of iron seemed to entwine them.

In the Cleveland *Plain Dealer* for Aug. 19 we are told of a married man—in fact, a conductor on the Cleveland & Pittsburg railroad—who gradually became infatuated with a married woman, both parties having children of their own. The infatuation went so far that the man left his wife and the woman her husband and lived together, I believe, as man and wife, for 18 months. At the end of this time the mother began to come to her senses. She wanted to get back to her husband and children—that is, if the wronged husband would again receive her. I am not at all surprised that the *woman* was the *first* one to come to a "right mind." The railroad conductor objected. They had what might be called, for a better word, "a lovers' quarrel." In fact, after Satan got them both well under his thumb, they had frequent quarrels, and finally this conductor drew a pistol and shot her dead. Below is what he said about it:

> I am sorry she is dead. She was my whole life. I don't care what they do with me now. I shot her because she threw me down. I went thru hell for this woman. I left my wife and my home. I have done everything for her, and have been true to her every second. But she gave me a dirty deal.
>
> She jilted me without a reason last Saturday night. She told me she was done. I went to her on Monday and asked her for an explanation. She refused to give it to me.
>
> I told her no other man ever would possess her after what I had gone thru for her. I made up my mind that no other man would get her.

What particularly impressed me was the expression, "I went thru hell for this woman," and he probably had it about right; and nobody can tell what "hell" he is *now* going thru while I write these words. I am going to try to get this, when in print, before him; and I am going to try, also, to point him "to the Lamb of God that taketh away the sin of the world," even tho he *is* a murderer; and even tho he has trampled under foot perhaps a string of God's holy commands, there is yet hope for him. I will point him to the passage which says, "Tho your sins be as scarlet, they shall be as white as snow; tho they be red like crimson, they shall be as wool."

John B. Gough, we are told, was once passing an inebriate lying in the gutter in a drunken stupor. He turned to a friend of his and said, pointing with his finger, ''But for the grace of God, there lies *John B. Gough.*'' And now, dear friends, when I saw that story about that railroad conductor, I felt like saying, ''But for the grace of God, there lies *A. I. Root.*''

''Jane Doe'' gave us a lot of caution in regard to the things that bring about just such tragedies as the one I have mentioned. She was talking to young girls, or unmarried women. I suppose her warnings could, of course, apply to married women and even to the heads of families as well as to the unmarried. It is common, this world over, for young men and women—yes, for boys and girls—to form acquaintance. Away back in my schooldays when I recited a lesson well I used to look for and expect an approving glance from a certain bright girl of about my age. I loved my schoolma'ams —I think I may say all of them. An encouraging smile from those good women was an incentive thru all my life. Now, all these things are right and proper; but after the man or woman enters matrimony each should realize the sacredness of the marriage contract—no more of what the world calls ''flirtations.''

I said at the close of another Home paper that a married man should be kind and courteous and pleasant to all girls and women; but he should make it his aim to be very careful to try to treat all alike. There should be no discrimination. The girls and women of the present day perhaps are doing more to make themselves attractive than they ever did before, and that is right and proper. Our lives are made brighter and happier by seeing pleasant girls and women nicely dressed, just as our lives are made pleasanter and happier by the beautiful flowers that God has given us for our enjoyment. God has wisely planned the wonderful and powerful attraction between the sexes in order that the human race may be perpetuated. But Satan gets in right there. When so many new styles and bright colors are brought in play to attract admiring glances from men folks of all ages, there is great danger of there being *too many* admiring glances, and also danger on the part of the young girls who plan to attract men by their smiling faces and repeated glances. In this way great harm may be done, altho scarcely a word is spoken. Old gray-haired men, especially if they happen to be well to do in this world's goods, are some of the worst sinners; and I do not know but a ''grayheaded sinner'' is about the worst kind of sinner we have. Witness the millionaires who have put away the faithful old wife in order to make room, perhaps, for some celebrated ''actress.'' Who can describe the awful anguish of a faithful wife when she discovers that some unprincipled chit of a girl is leading her husband away from her, away from his religion, and away from his God. Stealing money is bad, especially the money that has been earned thru many years by honest toil; but stealing the affections of a married man or those of a married woman is a thousand times worse than stealing money.

In closing, my favorite text comes vividly to mind, especially as it applies to married men and perhaps to women, too, along the line I have been talking about:

''Let the words of my mouth, and the meditation of my heart be acceptable in thy sight, O Lord, my strength and my Redeemer.''

A TRIBUTE TO THOSE GONE BEFORE US.

"Order [and Accuracy] Heaven's First Law."

I am sure the readers of Gleanings will all agree with me that Grace Allen's review of the beekeepers and beekeeping of years gone by is something for which she deserves our devout thanks. Her article in the August number, and also its continuation in the September issue, is what I allude to. What particularly called my attention to the matter is her kind words for myself on page 569, especially when she mentions ''standardizing hives.''

When my attention was first called to bee culture by that swarm of bees flying overhead, I was a watchmaker and jeweler, or, perhaps, more accurately, a watch-repairer and jeweler. If I remember correctly, the episode in regard to the swarm of bees occurred just about the time the American Watch Co. of Waltham, Mass., started to make watches. Before that time, when something gave out in a watch the repairer had to make it himself or buy something that came as near to it as possible, requiring a laborious fitting to make it answer. The American Watch Co. started out with the new idea of being able to furnish at a moderate price any part of a watch that would go right in and fit exactly, and they did it. I was just rejoicing at this wonderful achievement when I caught on to the way bees were kept and the way hives were made away back in those days. By the way, I wondered all along thru those valuable papers from Grace Allen how it was possible for the dear woman to get hold so *accurately* of things that happened before she was born. Well, when I first caught a glimpse of things, there were movable-frame hives of course, but it never seemed to have occurred to anybody that hives and frames should be made, like American watches. There were the Gallup frame, about 11 inches square, and the American frame a foot square; and Adair had another frame; Prof. Cook still another; Quinby, after he adopted frames, had still another. I gave diagrams and dimensions of all these frames, and then urged beekeepers, before it went on any longer, to decide on one frame and then have all the hives and frames, in the United States at least, so that they would be interchangeable; but the more I stirred things up, the more jangle there was. There were Jasper Hazen's hive, Mrs. Cotton's hive, the Twining hive, and, dear me! what an array! Just think of it! When somebody died and his bees were sold at auction, even if he had movable-comb hives, the purchaser would find that he was obliged to have two sizes of frames in his apiary. I was foolish enough in those days to decide on the American hive, and bought an "individual right" for Medina County. Shortly after, I got in touch with Samuel Wagner, then editor of the American Bee Journal, and he urged me to adopt the Langstroth frame, even if I did have a "county right." I think he further added that if I did not do it right away, at the time, I certainly would when I got further along in bee culture. Then I studied Langstroth and made his acquaintance, and arranged for a visit that I might get his reasons for adopting the frame he had decided on. Then I asked him to make me a frame exactly as he would have it. It happened to be 17⅝ x 9⅛. Then I gave my reasons in Gleanings, and had steel gauges made, both for the size of frame and the size of hives. Of course, I had much opposition. At a convention held in Cincinnati, at which Langstroth, H. A. King, Gallup, Adair, Muth, and others were present, when they were having a racket and turmoil about their respective *patents* on hives and frames I got up and said something as follows:

"My good friends, the time is coming when there will be no patent on hives. The time is coming when all that is needed for a hive will be a plain box without top or bottom; and when the hive is full of bees and and honey, similar hives will be set on top of it, and so on as may be needed."

I do not know whether my imagination went so far, just then, as to contemplate hives and crops of honey to the extent that the hives would be piled on top of each other (*filled with honey*, until a stepladder was needed), as we recently illustrated in Gleanings. I think that my suggestion at that convention was laughed at as something too ridiculous to be listened to; for at that time the Patent Office was burdened with models of patented hives, and the greater part of them without any movable frames at all. May the Lord be praised that we have lived to see hives and frames made by different manufacturers all over the world, and the most of them, like the American watches, made so accurately that, no matter where you purchase, the frames you buy will work nicely with the hives you already have in use.

I just made inquiry, and find that The A. I. Root Company now advertise only two sizes of frames—the Langstroth, and what they call the "Jumbo" Quinby frame, the one used by the Dadants.

By the way, after what I said in Cincinnati I went home and made what I called the "Simplicity" beehive; and I think that, for a time, I used a cover, that was also made to do service as a bottom-board; but later on the latter, altho it *could* be so used, did not seem to be advisable. I also invented, or perhaps I had better say, suggested, hand-holes cut in the hives with a wabbling saw so they could be more readily lifted and moved about.

Blueberries in New Jersey, Blueberries in Florida, and Blueberries in Alabama.

The question is just now coming up from different directions as to whether the blueberries in the North are the same as or very similar to those in the South. In regard to this our good friend Elizabeth White writes as follows:

> My dear Mr. Root:
>
> Mr. Coville, Botanist of the U. S. Department of Agriculture, who has oversight of the trial grounds at Whitesbog, has visited Mr. Sapp's blueberry fields in Florida. He tells me that the variety there is *Vaccinium virgatum*, while our blueberries are *Vaccinium corymbosum*. The corymbosum does not grow as tall as the southern blueberries, but the wild bushes at maturity are from five to ten feet high. All the plants in our fields are much too young to have reached their maximum height. While our blueberry plants do not grow as tall as the southern varieties, our berries are considerably larger—very much above one-half inch in diameter. Elizabeth C. White.
>
> New Lisbon, N. J., May 16, 1921.

Our readers will notice that reference is made to Dr. Coville. His name is also mentioned in our August and September issues as the one who first discovered that an acid soil is necessary for the blueberries; and Dr. Coville has also the credit of producing the choice large blueberries known at present, by crossing the best varieties growing wild, and growing plants from the seeds. In view of the above I take great pleasure in submitting the letter below from Dr. Coville:

> Blueberry cuttings are not easily rooted. We have developed, however, certain special methods of rooting them, which are in operation here at Washington on a small scale and at Whitesbog, near Browns Mills, New Jersey, on a large commercial scale by Miss Elizabeth C. White. These methods are described in "Directions for Blueberry Culture," 1921, now in press and expected to be issued within a few weeks. I shall be glad to send you a copy.
>
> The rooting of blueberry cuttings requires very close and continuous attention thruout almost the whole year. If one is not so situated that he can give the cuttings this close attention it is better to propagate by the processes of layering and stumping, which are also described in the bulletin.
>
> The plantation of H. A. Sapp, Crestview, Florida, is extremely interesting. He has transplanted with great success selected native blueberry plants which grow to very large size. I measured one of the older plants in his plantation, which he estimated as 15 to 20 years old, which was over 12 feet high, and another one which was over 13 feet high. Their spread was nearly as great as their height. They are too tall in fact for economical picking.
>
> Unfortunately for the interest of the general public Mr. Sapp's well-merited success is in process of exploitation by promoters who are selling blueberry plants and blueberry plantations under misleading advertisements. I found Mr. Sapp himself a very trustworthy and reliable man.
>
> Our Department of Agriculture selected blueberry hybrids, some of which bear berries three-

quarters of an inch in diameter, fruited in New Jersey from hybrid seedlings raised at Washington. Their berries are very much larger than any of the native Florida blueberries. We do not know whether these hybrids, which are of northern parentage, will do well in the climate of Florida, for they require a period of two to three months' winter chilling at a temperature of 40 degrees or less. I am sending you today a pamphlet entitled "The Influence of Cold in Stimulating the Growth of Plants," in which this important principle is described.

Very truly yours,
Frederick V. Coville,
Washington, D. C., Aug. 27, 1921. Botanist.

The pamphlet alluded to in the above letter is a beautiful little book of perhaps 40 pages, illustrated with many blueberry cuts, entitled ''The Influence of Cold in Stimulating the Growth of Plants.'' It refers particularly to Dr. Coville's experiments with the blueberry, and it proved to be of exceeding interest to me, as I have for years past been studying the influence of cold in bringing on a resting period for plants that they may start with vigor in the spring. Some years ago we did quite a business in shipping rhubarb plants down to Florida; but unless we had quite a freeze here in the North before the plants were taken up it was not a success. Blueberries must have a resting period, and they must be submitted to a certain degree of cold—that is, here in the North—before they will start with vigor; but Dr. Coville has discovered that there is no particular need that the *roots* be frozen nor even chilled. A plant kept in a greenhouse all winter will not start, or at least only very imperfectly, in the spring; but if a single branch or limb of this plant or tree be allowed to reach outside and get to freezing and thawing, it will grow all right. Before the plant can start with vigor in the spring the starch in the woody structure must be converted into sugar; and the alternate freezing and thawing does this. Dr. Coville does not allude to the maple-sugar business; but sugar-makers all know we must have a certain degree of cold before the maple tree yields its sap, and particularly the sweet sap that makes the delicious sugar and syrup.

The blueberry, like most other fruit-bearing plants, is a honey plant. Dr. Coville, in speaking of this matter, and of the conversion of starch and sugar in a growing plant, says something in the book I have been speaking of as follows:

> When this exudate of sugar occurs in flowers it is known as nectar, and it serves a useful purpose to the plant by attracting sugar-loving insects which unconsciously carry pollen from flower to flower and accomplish the beneficial act of cross-pollination. But sugar solution is often exuded outside the flower, in positions, or at times, that preclude any relation to cross-pollination. For example, a blueberry plant during its rapid growth, when a leaf has reached nearly full size, is sometimes observed to exude drops of sugar solution from certain glands of the leaf and on the back of the midrib.

The price of this pamphlet that pleased me so much is 30 cents. Address the Superintendent of Documents, Government Printing Office, Washington, D. C.

Here is something from our good friend Wilmon Newell, Dean of the Florida Experiment Station, Gainesville, Fla.:

Dear Mr. Root:

Huckleberries are cultivated quite extensively in the vicinity of Crestview and De Funiak Springs in the western portion of the State. A Mr. Sapp of Crestview has been growing the tree huckleberry for nearly 20 years and has cultivated plants that are from 12 to 20 years of age. These cultivated trees, according to our district agent, H. G. Clayton, are producing very well indeed. The fruit is about as big as one's little finger, and a quite ready market has been found thus far for the product. It is said that one tree now 18 years of age has produced as high as 32 quarts of the berries. The price received for them was from 15c to 20c a quart.

The cultivation of this plant in that part of the State has been sufficiently successful so that others are going into it and putting out orchards of this plant.

One of the very interesting things about this variety is that it is a native shrub in the swampy hammocks of west Florida, and this is where the people of that community got their start with it. I also understand that the nursery at Oldsmar, to which you refer, got their stock from Mr. Sapp at Crestview, who in turn got his from the woods. It seems that the favorite place in the woods for these shrubs is around the margins of pine "islands," which occur in the swampy hammocks.

So far as we can learn, no particular attention has been paid in that part of the State as to whether or not the plants are planted on acid soils. No attention seems to be paid to this phase of the question at all, yet the plantings that have thus far come into fruiting seem to be doing all right.

Wilmon Newell.
Gainesville, Fla., July 29, 1921.

In regard to Alabama we have had just one report as follows, and this is from a lady; and as our good friend Elizabeth White was the first to introduce cultivated blueberries in the North, it is quite fitting that a woman should be the pioneer in the work in Alabama:

> Could you advise me of any one who can use upland huckleberry plants? I have three different varieties. These are (1) the extra large blueberry, (2) the medium-sized blueberry, and (3) the medium-sized blackberry. All are delicious for pies, desserts, etc. The berries are in full prime during the month of June in southern Alabama. I can ship plants from now until February at any date.
>
> (Mrs.) S. A. Bradshaw.
> Luverne, Ala., Route No. 4, Aug. 8, 1921.

> In regard to your letter of Aug. 13, berries are all gone now. They are in prime during the months of June and July. No doubt but that they are just like what you had pictured in August Gleanings.
>
> No. 1, extra large bluberry, grows from 1 to 3 feet high, and has large clusters of berries. Nos. 2 and 3 grow from 12 to 18 inches high; rather low bushy varieties; have small clusters, from 3 to 6 berries to cluster, but really bear more berries than No. 1.
>
> S. A. Bradshaw.
> Luverne, Ala., Rt. 4, Aug. 27, 1921.

Mrs. Bradshaw's advertisement will be found in our advertising columns.

As inquiries are coming already as to where the plants can be obtained, I am glad to tell you that my ''long-time friend,'' E. N. Reasoner of the Royal Palm Nurseries, Oneco, Fla., is now prepared to furnish the plants. In answer to an inquiry he has just written me as below:

Dear Mr. Root:

We will have the Orchard Tree Blueberry, direct from Mr. Sapp, for winter planting, at 50c each, $4.50 per 10, or $40 per 100, in good strong stock.

Oneco, Fla., Aug. 27, 1921. E. N. Reasoner.

Classified Advertisements

Notices will be inserted in these classified columns for 30c per line. Advertisements intended for this department cannot be less than two lines, and you must say you want your advertisement in the classified column or we will not be responsible for errors. Copy should be received by 15th of preceding month to insure insertion.

REGULAR ADVERTISEMENTS DISCONTINUED IN GOOD STANDING.

(Temporary advertisers and advertisers of small lots, when discontinued, are not here listed. It is only regular advertisers of regular lines who are here listed when their advertisements are discontinued when they are in good standing.)

Herman McConnell, H. N. Major, I. F. Miller, A. S. Tedman, W. B. Crane, Leroy Lloyd, E. L. Lane, Noah Bordner, Daniel Johnson, Heard & Woodhull, Fairmount Apiary, J. W. Romberger, J. D. Kroha, Curd Walker, J. F. Michael, W. W. Talley, Ross B. Scott, Hazel V. Bonkemeyer, W. T. Perdue & Sons, A. W. Yates ,A. E. Crandall, D. T. Gaster, Southland Apiaries, Geo. A. Hummer & Sons, L. Parker, R. B. Grout, J. H. Haughey & Co. Julius Victor, Elmer Hutchinson & Son, E. F. Quigley & Son, Jay Smith, Robert B. Spicer, J. I. Banks, O. E. Tulip, Alfred A. Stutt, F. A. Lockhart & Co., Hardin S. Foster, Fred Leininger & Son, Jasper Knight, V. R. Thagard.

HONEY AND WAX FOR SALE.

FOR SALE—Amber honey in 60-lb. cans. P. W. Sowinski, Bellaire, Mich.

FOR SALE—Fancy clover honey in 60-lb. cans. Jos. Hanke, Port Washington, Wis.

FOR SALE—Buckwheat honey in 60-lb. cans. Bert Smith, Romulus, N. Y.

FOR SALE—Choice white clover honey in 60-lb. cans—none finer. J. F. Moore, Tiffin, Ohio.

FOR SALE—Clover honey in 60-lb. cans. F. W. Lesser, East Syracuse, R. D. No. 3, N. Y.

FOR SALE—Buckwheat honey in 60-lb. cans, by the case or ton. J. J. Lewis, Lyons, N. Y.

FOR SALE—White and amber honey in 5-lb. pails, packed in cases of 12. R. C. Wittman, St. Marys, Pa.

FOR SALE—New York State light amber honey, two 60-lb. cases $12.00 per case. I. J. Stringham, Glen Cove, N. Y.

FOR SALE—A ton of extracted honey suitable for baking purposes. E. D. Townsend & Sons, Northstar, Michigan.

FOR SALE—Clover, basswood, or buckwheat honey, in 5-lb. or 10-lb. pails, or 60-lb. cans. H. B. Gable, Romulus, N. Y.

FOR SALE—Finest clover honey. Packed in new 60-lb. cans and 5-lb. pails. Sample 15c. A. C. Ames, Weston, Ohio.

FOR SALE—Finest quality clover basswood and buckwheat honey, 5, 10 and 60 lb. tins. H. F. Williams, Romulus, N. Y.

FOR SALE—A-1 diamond-clear white sweet clover honey, in new 60-lb. cans, two cans to the case, 10c a pound, f. o. b. Moville, Iowa. Virgil Weaver.

FOR SALE—Extra fine well-ripened clover honey in 60-lb. tins, two cans to the case, at $15.50 per case. Adam Bodenschatz, Lemont, Ills.

FOR SALE—8000 lbs. choice white clover extracted honey. Sample 20c, applied on first order. C. H. Hodgkin, Rochester, Ohio.

FOR SALE—Extra fine white clover honey in new 60-lb. cans, two to the case, at $15.00, f. o. b. Ruthven, Iowa. Martin Carsmoe.

FOR SALE—Choice buckwheat honey, two 60-lb. cans to case at 10c per lb., f. o. b. here. Money refunded if not satisfied. Wm. Vollmer, Akron, N. Y.

FOR SALE—White clover honey, almost water white. Put up in new 60-lb. tin cans, two to the case. Write for prices. D. R. Townsend, Northstar, Mich.

FOR SALE—12,000 lbs. of choice white clover honey in 60-lb. cans at 15c per lb., f. o. b. Brooksville, Ky. Sample 25c. W. B. Wallin, Brooksville, Ky.

FOR SALE—White honey in 60-lb. cans, also West Indian in 50-gal. barrels. Sample and price on request. A. I. Root Co., 23 Leonard St., New York City.

FOR SALE—Extracted white or light amber honey. Good flavor for bottling purposes direct from producer. Send sample and lowest price to S. G. Crocked, Jr., Roland Park, Baltimore, Md.

FOR SALE—New crop extracted honey. Put up in new cans and cases. This honey extracted from sealed combs and is of finest quality. Also have comb honey. Gelser Bros., Dalton, N. Y.

FOR SALE—New crop finest quality white clover and basswood extracted honey in new 60-lb. tin cans, 2 cans in case, at $12.50 for case, f. o. b. Sample 10 cents. Alice Burrows, Oran, N. Y.

FOR SALE—Extra choice extracted white clover honey, put up in 60-lb. cans and 5-lb. lithographed pails. Sample 20c. Same to apply on first order. E. J. Stahlman, Grover Hill, Ohio.

FOR SALE—Clover, basswood, or buckwheat honey, comb and extracted, by the case, ton, or carload. Let me supply your wants with this fine N. Y. State honey. C. B. Howard, Geneva, N. Y.

EXTRA fine white sweet clover honey, new crop, in 5-gal. cans, case of two cans, $15.00; one can, $8.00. Write for prices on a ton or a carload. Sample 10c. C. S. Engle, 200 Center St., Sioux City, Iowa.

HONEY FOR SALE—In 60-lb. tins. water-white orange, 14c; water-white sweet clover, 12c; extra L. A. sage, 11c; N. Y. State buckwheat, 10c, for immediate shipment from New York. Hoffman & Hauck, Inc., Woodhaven, N. Y.

FOR SALE—White honey, 15c a lb.; L. A. alfalfa, 14c, in two 60-lb. cans; Chilian in 165-lb. kegs, 10c; light amber honey in 50-gal. bbls., 80c a gal. Beeswax, 30c a lb. Walter C. Morris, 105 Hudson St., New York City.

FOR SALE—New crop choice clover extracted honey packed in NEW cans and cases at $14.85 per case of two 60-lb. cans. A few cases of last year's clover honey at 10c. Write for price on 10 or more cases of new honey. J. D. Beals, Oto, Iowa.

YOU only have to buy 600 pounds of E. D. Townsend & Sons' fine clover extracted honey to get their very lowest wholesale price this year. If your customers require the best, write them at Northstar, Michigan, for their price.

FOR SALE—No. 1 white comb honey, $6.00 per case; No. 2 white comb, $5.00 per case of 24 sections; six cases to carrier. Clover extracted, two 60-lb. cans to case, 15c a lb.; clover in five-lb. pails, $1.00 each, 12 pails to case. Amber baking honey in 60-lb. cans, 10c; same in 50-gal. barrels, 8c, H. G. Quirin, Bellevue, Ohio.

FOR SALE—Several thousand pounds of the finest quality clover extracted honey. New cans and cases. None better produced. Howard Townsend, Northstar, Michigan.

FOR SALE—Extra choice extracted white clover honey, put up in new 60-lb. cans and 5-lb. pails. Sample 20c, same to apply on first order. David Running, Filion, Mich.

EXTRA fancy well-ripened clover honey in new 60-lb. tins, two cans to the case, $16.00 per case. Write for prices on larger quantities. Sample 20c, to be applied on first order. Edw. A. Winkler, Joliet, R. D. No. 1, Ills.

CLOVER, BASSWOOD, and BUCKWHEAT HONEY. Clover in new 60-lb. cans, 10c. Buckwheat in new cans and kegs, 8c. Also buckwheat comb, No. 1, 17c in 28-box cases. Don't be late. Order now. E. L. Lane, Trumansburg, N. Y.

FOR SALE—Well-ripened clover honey, rich and thick, in 60-lb. cans, 15c f. o. b. Brooksville. Sample 15c. Also have some in 10-lb. pails at $2.00 postpaid to third zone. Adam Kalb, Brooksville, Ky.

FOR SALE—Extra fine Michigan white clover and basswood honey. Almost water white. Indeed, I doubt if the color, body, and flavor can be beat. Put up in 60-lb. cans, two to the case, at 15c per pound, or in 5-lb. pails, 50 to the barrel, at 17c per pound. Sample 15c. O. H. Schmidt, R. D. No. 5, Bay City, Mich.

RASPBERRY HONEY, blended with goldenrod. Left on the hives until thoroly ripened. It is good thick body, rich and delicious. Put up for sale in new 60-lb. cans. Price, 2 cans in a case, $18.00. One can in a case, $9.50. Sample by mail 20c, which may be applied on purchase of honey. Elmer Hutchinson & Son, Lake City, Mich.

I HAVE about 30,000 lbs. of choice sweet clover honey and to get some cash hurriedly I will sell it at 10c per pound f. o. b. Don't think anything wrong because it is cheap, for it is clear and all sealed on hives before extracting, and put up in second-hand cans that are as good as new on inside. Try it. Joe C. Weaver, Cochrane, Ala.

MY superior quality of extracted clover honey is ready for market. Produced above a queen-excluder in pure white combs. Put up in new 60-lb. cans, two cans to the case. My manner of selling this year is, place an $18.00 order in a letter for one case of 120 lbs. When the honey arrives at your station, open it up and examine it. If it is not all that I say about it nail it up and return it at my expense and I will cheerfully return your money. "Mr. Buyer, is it fair?" 15c a pound from 1 to 1500. C. D. Townsend, St. Johns, R. D. No. 2, Mich.

FOR SALE—A carload of the very finest quality extracted honey. This crop of honey was produced above excluders, in white combs that have never been used for brood; then the entire crop was left upon the hives until some time after the close of the honey flow, so is very thoroly cured by the bees. It is being put into new 60-lb. net tin cans, in fact, not a single thing has been neglected to make this crop of honey the finest possible to produce. It was gathered from white clover principally, with a very little basswood mixed in it, perhaps 5%. Of course, this fine honey is worth more than ordinary honey and we have to ask just a little above market price for it, so those not having a market that will pay a little more for an extra quality honey, had better not write about this year's crop of honey. E. D. Townsend & Sons, Northstar, Michigan.

HONEY AND WAX WANTED.

WANTED—Bulk comb and section honey. J. E. Harris, Morristown, Tenn.

WANTED—Honey, section, bulk comb, and extracted. W. A. Hunter, Terre Haute, Ind.

HONEY WANTED—Give particulars in first letter. Elton Warner, "Beaverdam," Asheville, N. C.

BEESWAX WANTED—For manufacture into SUPERIOR FOUNDATION. (Weed Process.)
Superior Honey Co., Ogden, Utah.

WANTED—Extracted clover honey (new crop). State how packed. Send sample and name lowest price f. o. b. Brooksville, Ky. H. C. Lee.

WANTED—Beeswax, also old comb and cappings to render on shares. Will buy your share and pay the highest market price. F. J. Rettig, Wabash, Ind.

I AM in the market for white clover, basswood or amber honey. Send sample and quote me your lowest prices delivered f. o. b. Preston. M. V. Facey, Preston, Minn.

WANTED—All kinds comb and extracted honey and beeswax. Car lots or less—and full colonies of bees. W. C. Morris, 170 Rossiter Ave., Yonkers, N. Y.

WANTED—Shipments of old combs and cappings for rendering. We pay the highest cash and trade prices, charging but 5c a pound for wax rendered. The Fred W. Muth Co., Pearl and Walnut Sts., Cincinnati, O.

WANTED—Beeswax. We are paying 1 and 2c extra for choice yellow beeswax, and in exchange for supplies we can offer a still better price. Be sure your shipment bears your name and address, so we can identify it immediately upon arrival, and make prompt remittance. The A. I. Root Co., Medina, Ohio.

WE BUY honey and beeswax. Give us your best price delivered in New York. On comb honey, state quantity, quality, size, and weight of sections and number of sections to a case. Extracted honey, quantity, quality, how packed, and send samples. Chas. Israel Bros. Co., 486-490 Canal St., New York City.

FOR SALE.

ROOT'S GOODS AT ROOT'S PRICES. A. W. Yates, Hartford, Conn.

HONEY LABELS—New designs. Catalog free. Eastern Label Co., Clintonville, Conn.

FOR SALE—A full line of Root's goods at Root's prices. A. L. Healy, Mayaguez, Porto Rico.

ROOT'S BEE SUPPLIES—For the Central Southwest Beekeepers. Beeswax wanted. Free catalog. Stiles Bee Supply Co., Stillwater, Okla.

PORTER BEE-ESCAPES save honey, time, and money. Great labor-savers. For sale by all dealers in bee supplies. R. & E. C. Porter, Lewiston, Ill.

FOR SALE — "SUPERIOR" FOUNDATION, "quality unexcelled." Let us prove it. Order now. Superior Honey Co., Ogden, Utah.

HUBAM, or White Annual Sweet Clover. Grow it for your bees, and get a seed crop, while the seed is scarce. Booking orders for fall delivery. E. G. Lewis Co., Media, Ills.

FOR SALE—10 Miller feeders, nailed and painted, new, the lot $7.50; 5 Root queen-mating boxes, nailed and painted, complete, new, the lot $7.00; 10 8-frame wood-and-zinc queen-excluders, new, the lot, $4.00; 1 Buckeye hive Alexander feeder, new, 50c; 5 8-frame metal hive covers, good as new, the lot, $7.00. No disease. Glenwood Beard, Prospect, Box 155, Ohio.

FOR SALE—Used 60-lb. honey cans in good condition. 10 cases for $4.50. E. Meineke, 3852 N. Kenneth Ave., Chicago, Ills.

FOR SALE—Cowan rapid reversible extractor. Extracted only 2800 lbs., in A-1 shape. Write for price. Herman Tebbe, Dow City, Iowa.

FOR SALE—After Dec. 1 next we expect to offer beekeepers entirely reliable and guaranteed Hubam seed of best quality. The A. I. Root Co., Medina, Ohio.

SHIPPING CASES—1000 12-lb. three-row shipping cases, 2-inch glass for 4¼x4¼x1½-inch plain sections. These cases are complete, KD, packed in crates of 50. Price per crate, $12.50. The A. I. Root Co., Medina, Ohio.

FOR SALE—Five-gallon square cans with 1¾-inch cork-lined screw cap, one can in case, 75c, two cans in case, $1.35. Light brood foundation in 25-lb. boxes only, per lb. 65c. Also ten-frame hive-bodies, reversible bottoms and covers nailed and painted. Lake Region Honey Co., Birchwood, Wis.

REAL ESTATE

FOR SALE—20-acre farm, 200 colonies of bees, and equipment, ¾ acre ginseng and Golden Seal. L. Francisco, Dancy, Wis.

FOR SALE—30 acres of land near Arcadia, Fla., bungalow house with two large porches, 40 colonies of bees, more or less; 250 colonies of bees in six apiaries along the Caloosahatchee River. Fine location for honey, to ship bees or rear queens. No disease. Ward Lamkin, Arcadia, Fla.

WANTS AND EXCHANGES.

WANTED—Some seed of horsemint, also a few seeds of gallberry. P. B. Brown, Grantsburg, Wis.

WANTED—A Cowan two-frame extractor with 12-inch pockets. Address Edw. G. Saxe, Riverside, Ill.

WANTED—First editions of the writings of noted books on bees. Apply to Mrs. Fox, Foxden, Peekskill, N. Y.

WANTED—A two-frame reversible extractor, at once. State price. Van Collins, Riversville Road, Port Chester, N. Y.

WANTED—Old combs and cappings for rendering on shares. Our steam equipment secures all the wax. Superior Honey Co., Ogden, Utah.

WANTED—To buy a carload of bees. Must be sound, on wired combs and extracted-honey outfit. Virgil Weaver, Moville, Iowa.

BEESWAX wanted. Old combs (dry) and cappings for rendering. Also wax accepted in trade. Top market prices offered. A. I. Root Co. of Iowa, Council Bluffs, Iowa.

OLD COMBS, cappings, or slumgum wanted for rendering by steam press process. We pay cash for wax rendered, trade for supplies, or work it into foundation. W. T. Falconer Mfg. Co., Falconer, N. Y.

EXCHANGE—Ideal Hammond typewriter. Cost $100 new. In perfect condition. Will exchange for two good swarms of Italian bees in ten-frame hives in strong condition. Chas. F. Hopwood, Caldwell, N. J.

OLD COMBS WANTED—Our steam wax-presses will get every ounce of beeswax out of old combs, cappings, or slumgum. Send for our terms and our new 1921 catalog. We will buy your share of the wax for cash or will work it into foundation for you. Dadant & Sons, Hamilton, Illinois.

WANTED—About Nov. 15, reliable farmer capable of taking full charge of 550-acre farm in Albemarle County, Va. Good house in fine oak grove, good neighbors, convenient to several towns and State University. Attractive share arrangement for man who can do general farming and handle live-stock, poultry, fruits, and bees. Address J. H. Millsaps, 6022 Harper Ave., Chicago, Ills.

MISCELLANEOUS

FOR SALE—A 32-40 cal. Marlin repeating rifle; also a Ranger Superb bicycle. Both in first-class condition. Write for particulars. Clarence Locknow, Buskirk, R. D. No. 1, N. Y.

BOOKING orders for low bush huckleberry plants. No. 1 extra large blue, No. 2 blue, No. 3 black, at 50c each; $5.00 per doz. Over 12 doz., $4.00 per doz. Fill orders until January. Mrs. S. A. Bradshaw, Luverne, R. D. No. 4, Ala.

MEDICINAL roots and herbs are very profitable to grow. We especially recommend growing Golden Seal, which with good care will yield as high as $10,000 per acre for each crop. It takes several years to mature but will average $1000 a year. Special Crops, a monthly paper, tells how. Sample copy, 10c; $1.00 per year. Address Special Crops Pub. Co., Box "G," Skaneateles, N. Y.

BEES AND QUEENS.

FOR SALE—Italian queens, nuclei, and packages. B. F. Kindig, E. Lansing, Mich.

HARDY Italian queens, $1.00 each. W. G. Lauver, Middletown, Pa.

SEE our page advertisement on page 659 for prices. Buckeye Bee Co., Justus, Ohio.

WHEN it's GOLDEN, it's PHELPS. C. W. Phelps & Son, Binghamton, N. Y.

FOR SALE—50 hives of bees and 100 supers, $150. E. C. Young, Clinton, Mich.

GOLDEN Italian queens, untested, 1, $1.25; 6, $7.00. E. A. Simmons, Greenville, Ala.

FOR SALE—24 colonies Italian bees at bargain prices. Edward B. Stover, Newburyport, Mass.

PHELPS GOLDEN QUEENS will please you. Mated, $2.00; 6, $10.00; or $18.00 a doz. C. W. Phelps & Son, Binghamton, N. Y.

BEES AND QUEENS from my Carolina apiaries—progeny of my famous Porto Rican pedigreed breeding stock. Elton Warner, Asheville, N. C.

THE A. I. ROOT CO. pure leather-colored queens, untested, 1, $1.25; 6, $7.00. Greenville Bee Co., Greenville, Ala.

FOR SALE—Bright Italian queens, $1.50 each; $14.00 per doz. Ready after April 15. T. J. Talley, Greenville, R. D. No. 3, Ala.

FOR SALE—A few choice queens shipped in frame brood, $4.00 each. Jes Dalton, Bordelonville, La.

FOR SALE—20 swarms of strong, healthy Italians. Price, single-walled, $9; double-walled, $12. Come and see them. N. A. Clay, Oberlin, Ohio.

FOR SALE—Italian queens, package bees, and nuclei for 1922. Shipping begins March 15. Circular free. Dr. White Bee Co., Sandia, Texas.

FOR SALE—Leather-colored Italian queens from Dr. Miller's breeder. Virgins, $1.00; mated, $1.50; tested, $2.50. F. R. Davis, Stanfordville, Dutchess County, N. Y.

FOR SALE—Few more golden and three-banded queens, at 75c each; 6 for $4.00; 12 for $8.00. G. H. Merrill, Pickens, S. C.

FOR SALE—350 colonies of a fine strain Italian bees, fall well supplied with honey. Write for full particulars. Chas. Heim & Sons, Three Rivers, Texas.

FOR SALE—500 colonies in 4 yards, with power extractor, easy terms, near English colony. Very healthful, wonderful flows, local market. M. C. Engle, Herradura, Cuba.

FOR SALE—Three-banded Italian queens, untested, $1.25; 6, $7.50; 12, $14.00. Tested queens, $2.50 each. The above queens are all select. Robt. B. Spicer, Wharton, N. J.

1922 PACKAGE BEES AND QUEENS, untested and day-old, in Thompson safety introducing cages. Discounts on early advance orders. James McKee, Riverside, Calif.

WE are now booking orders for spring delivery of our queens and package bees. Write us your wants and ask for prices. Graydon Bros., Greenville, R. D. No. 4, Alabama.

BEES BY THE POUND — Also QUEENS. Booking orders now. FREE circulars giving details. See larger ad elsewhere. Nueces County Apiaries, Calallen, Texas. E. B. Ault, Prop.

AM now ready to mail out young queens of Dr. Miller strain leather-colored Italians, by return mail at $1.25 each. A few breeders for sale. S. G. Crocker, Jr., Roland Park, Baltimore, Md.

COLORADO QUEENS—Pure Italians. Our sunny climate and altitude produce the best there are. Write now for price list. C. I. Goodrich, breeder of fine queens, Wheatridge, Colo.

SHE-SUITS-ME queens, season of 1921. Untested Italians: After June 15, $1.50 each, up to nine queens; 10 to 24 queens, $1.40 each; 25 and up, $1.25. Allen Latham, Norwichtown, Conn.

FOR SALE—45 colonies of Italian bees in 8 and 10 frame dovetailed hives with extra supplies all in first-class condition. Mrs. C. J. Beck, Bethel, R. D. No. 3, Conn. Telephone, Newton 6-12, Conn.

IF GOOD bright Italian queens are wanted by return mail, send your order to M. Bates, Greenville, Ala. Price, $1.00 each; $10.00 per dozen; $75 per 100. Pure mating, safe arrival, and satisfaction guaranteed.

FOR SALE—41 colonies of bees in 10-frame hives, Hoffman frames, wired, full sheets of foundation, good condition, no disease, all or part of them, $6.50 per colony. Richard Knorr, Palatka, R. D. No. 2, Fla.

FOR SALE—30 colonies of bees. No disease. 8-frame, $10.00 each. 100 8-frame extracting supers, filled with foundation or drawn combs, or empty frames. 6-inch foundation mill. Hickory Shade Apiary, Otterville, Mo.

OCTOBER QUEENS—Ready to ship. Let me have the order. Untested, 85c; tested, $1.25 each. Booking orders for package bees 1922 shipment. Two pounds bees, no queen, $3.75. No disease. D. W. Howell, Shellman, Ga.

FOR SALE—Unsurpassed Italian queens. Untested, 1, $1.50; 6, $7.50; 12, $14.00; 50, $55.00; 100, $105. Tested, 1, $2.50; 6, $13.50. My queens are actually laying before they are sent out. J. D. Harrah, Freewater, Oregon.

FOR SALE—My entire bee business, about 400 colonies of bees; about 200 supers, extractor, and outfit; one 6-room house and two lots in Fargo, Ga. One Reo speed wagon, good condition. Write for prices. W. B. Bradley, Fargo, Ga.

FOR SALE—30 colonies Italian bees, new 10-frame hives, wired, full sheets foundation, in lots to suit, $10.00 each. Harry C. Klaffenbach, Muscatine, Iowa.

QUEENS OF QUALITY for 1922. Three-banded Italians only. After April 15, untested, $1.25; tested, $2.00. Satisfaction guaranteed. P. M. Williams, Ft. Deposit, Ala.

FOR SALE—50 colonies of Italian bees in 8-frame hives. Have plenty of stores for winter. $10.00 per colony . E. L. Lane, Trumansburg, N. Y.

FOR SALE—Root's strain of Golden and leather-colored Italian queens, bees by the pound and nuclei. Untested, $1.50 each; select untested, $2.00; tested, $2.50 each; select tested, $3.00. For larger lots write. Circular free. A. J. Pinard, 440 N. 6th St., San Jose, Calif.

WE are now equipped to handle your early spring orders for package bees, and Italian queens, especially bred for the production of honey. Prices will be in accord with the reduction in material and labor. Safe arrival guaranteed. Write for prices and terms. Sarasota Bee Co., Sarasota, Fla.

FOR SALE—200 colonies of bees, in 10-frame double-walled hives; 400 supers, extractor, extracting combs, etc. A real bargain and one of the best-kept apiaries in the State. Everything in first-class shape. Must all be sold in one bunch. G. H. Creech, Central City, Nebr.

FOR SALE—12 colonies of Italian bees on Hoffman frames, wired, with full sheets of foundation. Each colony headed with an untested queen from the Stover Apiaries and to be shipped in a home-made hive without top or bottom. Price, $10.00 for 8 frames. B. B. Jones, Lake Roland, Md.

WE are now booking orders for our three-banded leather-colored Italian bees and queens for spring shipment. 2-lb. packages only. No disease, safe arrival in U. S. and Canada and satisfaction guaranteed. Write for particulars and prices. J. M. Cutts, Montgomery, R. D. No. 1, Ala.

ACHORD'S ITALIAN QUEENS are a bit better than the best of the rest. We can supply you by return mail. Three-banded Italians only. Large, vigorous, well marked, gentle. Guaranteed to give you satisfaction. Untested, $1.00 each; 6, $5.50; 12, $10.50; 25, $20.00; 50, $38.00. Tested queens, $1.75 each. W. D. Achord, Fitzpatrick, Ala.

PHELPS' GOLDEN ITALIAN QUEENS combine the qualities you want. They are GREAT HONEY-GATHERERS, BEAUTIFUL, and GENTLE. Virgins, $1.00; mated, $2.00; 6 for $10.00, or $18.00 per doz.; tested, $5.00. Breeders, $10 to $20. Safe arrival guaranteed only in the U. S. and Canada. C. W. Phelps & Son, Binghamton, N. Y.

FOR SALE—400 two-story colonies of bees in first-class shape, free from disease, located in three yards. One acre land with buildings and water, and small fruit. Lease three years free goes with the bees. One crop will more than pay for the bees. Price $3600, two-thirds cash, balance to suit. Finest alfalfa range in Colorado. Bert W. Hopper, Rocky Ford, Colo.

CALIFORNIA ITALIAN QUEENS, the old reliable three-banded stock that delivers the goods. Every queen actually LAYING before being caged, and fully guaranteed. I also guarantee safe arrival. SPECIAL FALL PRICES, select untested, 1, $1.25; 6, $7.00; 12, $13.00; 25 to 99, $1.00 each; 100 and over, 90c each. Package bees for next spring delivery. Circular free. California Apiaries, J. E. Wing, Prop., 155 Schiele Ave., San Jose, Calif.

WE believe we have the best Italian queens obtainable. Our new system is working wonders. Book your order now for 1922. Untested, $1.25; tested, $2.25; virgins, imported mothers, 50c. Am booking orders for 1922. F. M. Russell, Roxbury, Ohio.

QUEENS—A SUPERIOR STRAIN. Bred from a queen whose colony gathered 200 lbs. honey while the other colonies did very little. Queens, untested, $2.00 each; tested, $3.00. Doolittle strain; queens, untested, $1.25; tested, $2.00. 40 years' experience in queen-rearing. Chestnut Hill Apiary, Aspers, Pa.

EARLY spring delivery, 1922. Three-banded stock only. One Hoffman frame emerging brood, one good untested queen, one pound bees, April delivery, $5.25 each package. Same as above, May delivery, $4.75. 5 per cent discount on 25 packages or more; 10 per cent deposit to book your order. L. C. Mayeux, Hamburg, La.

FOR SALE—50 colonies of bees in Root 10-frame metal-covered hives, free from disease and with ample stores for winter. This is a first-class outfit for any one. All tested queens, no queens over 3 months old, and raised from the finest stock to be had. $15.00 per colony. Can be seen any time at the yard. J. F. Garretson, Queen-breeder, Bound Brook, N. J.

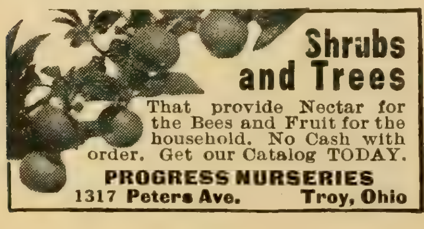
FOR SALE—Package bees for spring delivery, three-band strain, bred for business. $1.50 cash books your order. Safe arrival and satisfaction guaranteed. A two-pound package of bees and select untested queen for $5.00; 25 or more for $4.75 each. Write for prices on larger lots. Caney Valley Apiaries, J. D. Yancey, Mgr., Bay City, Texas.

TO MY FRIENDS, OLD AND NEW—During our buckwheat flow we rear our best queens. Hardy, prolific, disease-resistant, honey-gathering Italian stock. We have combined color and utility and each queen guaranteed to arrive safely and give satisfaction. October prices by return mail, untested, 1, $1.25; 6, $7.00; 12, $13.00; 25 for $25.00. J. B. Hollopeter, Rockton, Pa.

FOR SALE—Spring delivery, 1922, our fine three-banded Italian bees and queens. All bees are shipped on a standard frame of honey and hatching brood. 1 lb. of bees, 1 good untested queen, $4.25; 2 lbs. bees and queen, $5.50; 3 lbs. as above, $6.50, f. o. b. Hamburg. All dead bees will be promptly replaced if noted by agent on express tag. 20 per cent down to book your order. Can furnish government health certificate with each package. Will start shipping May 1. C. A. Mayeux, Hamburg, La.

PATENTS Practice in Patent Office and Court. Patent Counsel of The A. I. Root Co.

Chas. J. Williamson, McLachlan Building,
WASHINGTON, D. C.



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That provide Nectar for the Bees and Fruit for the household. No Cash with order. Get our Catalog TODAY.

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1317 Peters Ave. Troy, Ohio

NEWMAN'S ITALIAN QUEENS

BRED FROM THE BEST ABSOLUTELY FIRST QUALITY and fully guaranteed. No disease. Satisfaction and safe arrival. Untested, $1.25; 6, $7.00; 12, $13.50. Select Untested, $1.75; 6, $9.00; 12, $17.00. Circular free.

A. H. NEWMAN, Queen Breeder
MORGAN, KY.

LEWIS 4-WAY BEE ESCAPES

LEWIS
REGISTERED
4-WAY
BEE
ESCAPE
PATENT APPL'D. FOR

Four exits from supers. Fits all standard boards. Springs of coppered steel. Made of substantial metal. Price each 20c postpaid. Made by

G. B. Lewis Company, Watertown, Wis., U.S.A.

Sold only by Lewis "Beeware" Distributors.

REQUEEN YOUR COLONIES

No time is better than right now to prepare for perfect wintering by requeening your colonies.

Use surplus brood for increase and give each colony of increase so made one of our young untested Italian queens.

One for.......... $ 1.25
Twelve for....... 14.00
One hundred for.. 98.75

Write or wire for our proposition by which we furnish honey containers free and sell your crop for cash at a small charge for our selling service that sells, and "Fosters your business."

THE FOSTER HONEY & MERC. CO.
BOULDER, COLO.

1922

Place your order now for 1922 delivery of

FOREHAND'S THREE BANDS

The Thrifty Kind.

They are *surpassed by none but superior to many.*

Package Bees **Three-Banded Queens**

Write for prices now.

W. J. Forehand & Sons

Fort Deposit, Ala.

ROOT'S BEE SUPPLIES

Carload stocks at Ohio's distributing center. Orders filled the day they come in. Save time and freight by ordering from

A. M. MOORE, Zanesville, Ohio

22½ S. Third Street.

LARGE, HARDY, PROLIFIC QUEENS

Three-band Italians and Goldens. Pure mating and safe arrival guaranteed. We ship only queens that are top notchers in size, prolificness, and color. After June 1st: Untested queens, $1.50 each; 6 for $8.00; 12 or more, $1.40 each; 25 or more, $1.25 each. Tested queens, $3.00 each; six for $16.00.

Buckeye Bee Co., Justus, Ohio.

World's Best Roofing at Factory Prices

"Reo" Cluster Metal Shingles, V-Crimp, Corrugated, Standing Seam, Painted or Galvanized Roofings, Sidings, Wallboard, Paints, etc., direct to you at Rock-Bottom Factory Prices. Positively greatest offer ever made.

Edwards "Reo" Metal Shingles

cost less; outlast three ordinary roofs. No painting or repairs. Guaranteed rot, fire, rust, lightning proof.

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Get our wonderfully low prices and free samples. We sell direct to you and save you all in-between dealer's profits. Ask for Book No. 183

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Lowest prices on Ready-Made Fire-Proof Steel Garages. Set up any place. Send postal for Garage Book, showing styles.

THE EDWARDS MFG. CO.,
1033-1083 Pike St., Cincinnati, O.

FREE Samples & Roofing Book

Our Food Page—Continued from page 635.

honey is as a breakfast sweet. When we housekeepers have guests at breakfast and have no grapefruit—in season—we feel rather cut up about it, don't we? I am no statistician, but if every housekeeper in the country felt the same way about honey I know the beekeeping industry would boom.

The Englishman likes his orange marmalade for breakfast and I think there is a growing tendency in this country to include something sweet with the breakfast; at least, I find that guests seem to take to our honey habits in the morning readily. Also I have noticed articles by other food writers who recommend honey for breakfast.

We are told so much depends upon getting the right start for the day. For that reason and because many have little appetite for breakfast it is well to serve foods that are beautiful and tempting-looking, and a section of honey or a jar of pale-gold extracted honey is as beautiful as a bowl of flowers.

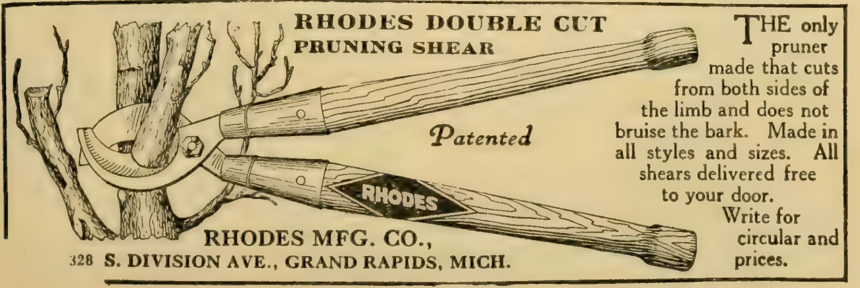
When honey is served with muffins or other hot breads for simple suppers or lunches no cake or other sweet dessert is needed. It not only saves a housekeeper's time, but her family will feel better than if they have eaten a made sweet or dessert which is often rather indigestible.

Honey can be used to advantage wherever preserves or conserves are used, and again I believe the honey is much better for us than the made sweet.

And after saying all I have against the indiscriminate use of honey in baking we all know that there are certain fruit cakes, chocolate cakes, drop cakes, puddings, and cookies which are never at their best without honey, that it adds to their richness, texture, flavor, and keeping qualities, and such recipes are safe to recommend to the public.

"Best" Hand Lantern

A powerful portable lamp, giving a 300 candle power pure white light. Just what the farmer, dairyman, stockman, etc. needs. Safe—Reliable—Economical—Absolutely Rain, Storm and Bug proof. Burns either gasoline or kerosene. Light in weight. **Agents wanted. Big Profits. Write for Catalog.** **THE BEST LIGHT CO.**
306 E. 5th St., Canton, O.



RHODES DOUBLE CUT PRUNING SHEAR

Patented

THE only pruner made that cuts from both sides of the limb and does not bruise the bark. Made in all styles and sizes. All shears delivered free to your door. Write for circular and prices.

RHODES MFG. CO.,
328 S. DIVISION AVE., GRAND RAPIDS, MICH.

Honey Markets.—Continued from page 608.

in very limited quantities. Sales direct to retailers, in small lots Colorado, white clover, and alfalfa, 24-section cases No. 1 heavy $7.50-8.00. Extracted: Moderate receipts of new stock from the South reported. Demand and movement limited and mostly in small lots. Few sales to wholesalers, southern, light amber various mixed flavors in 5-gal. cans 7-10c per lb., dark and inferior nominally quoted 1-1½c lower. Sales to retailers, Colorado, light amber alfalfa in 5-gal. cans 8-10c per lb., dark and inferior low as 6c. Beeswax: Receipts light. Demand and movement poor, market weaker. Sales to jobbers, southern, ungraded average country run wax, 23c per lb.

From Producers' Associations.

It is now possible to make a fairly accurate estimate of the honey crop in Colorado.

Taking the State as a whole, the production will not exceed 70 per cent of a normal crop; probably 65 per cent will be nearer right. Contrary to expectations the production of comb honey has not been materially increased; those that have switched over to extracted evidently intend to stay with it.

Demand for extracted honey in carlots is improving some, and sales have been made at from 8 to 8½ cents for white, new crop. These prices are f. o. b. loading point.

Comb honey in carlot is in good demand, and sales for well-graded stock have been made at $5.50 for No. 1 and $5.15 for No. 2 f. o. b. Denver.

Beeswax is coming in freely, and owing to present low prices of wax we suggest to beekeepers to hold it until prices improve.

The Colorado Honey Producers' Association.
Denver, Colo., Sept. 15. F. Rauchfuss, Mgr.

We will do well to ship half of a normal crop this fall. Our spring conditions were very unfavorable, some of our people having to feed until July 1. It was found that alfalfa weevil had spread from the Payette Valley west to Weiser, also across the Snake River into a fine producing territory near Ontario and Nyssa, Oregon. This condition reduced the honey flow from our second crop of alfalfa. It was later found that altho our fields were full of bloom that bees failed to obtain nectar.

We are now quoting new crop extracted honey at 10c, net to us, f. o. b. our shipping points. Several weeks ago we sold cars at 8¼ and 9¼ cents We are not moving honey at 10c, but believe it will advance to 10c or over when buyers discover general crop shortage.

We have not had crop reports on comb honey from members and have made no quotations to date. We expect to sell at about the same schedule as we had last season, namely: Fancy, $7.00; No. 1, $6.75; No. 2, $6.50. Inquiry for comb is heavy.

Idaho-Oregon Honey Producers' Association,
P. S. Farrel, Sec'y-Treasurer.
Caldwell, Ida., Sept. 15.

Special Foreign Quotations.

LIVERPOOL.—During the past month we have had a good export demand for Chilian honey, sales being 2,400 barrels at irregular prices. The stock now on hand is small. A cable from Chile says the crop is exhausted. The value of extracted honey is about 8 cents a pound. The beeswax market is about 23 cents a pound. Taylor & Co.
Liverpool, England, Sept. 6.

CUBA.—We quote honey at 40 cents a gallon, and wax $22.00 per hundred pounds.
Matanzas, Cuba, Sept. 12. Adolfo Marzol.

OUR ADVERTISING GUARANTEE.

In the November issue of Gleanings in Bee Culture we shall publish a revised and condensed statement of our Advertising Guarantee and Conditions. We ask every advertiser in our columns and our every reader to watch for this, to read it, and to preserve it. Managing Editor.

JENSEN'S APIARIES

BREEDER OF PURE ITALIAN BEES AND QUEENS

CRAWFORD, R. R. 3, MISS.

Sept. 12th, 1921.

To the Beekeeping Public:

Lest you forget the last chance to requeen or provide any queenless colonies with queens this year. Let us furnish them; we can, we will, and are doing it daily for those who have used our queens and found them "Infallible."

Get your name on our mailing list so we can send you our circular and price sheet occasionally to keep you informed as to what is best and cheapest, quality considered, of bees, queens, etc.

Our capacity has been greatly increased to keep pace with the growing demand for our stock.

Let us figure with you on your 1922 wants for Nuclei, Combless Packages and Queens. We guarantee to please you.

Thanking those of you who have patronized us so liberally this year, and hoping the season has turned out a bounteous harvest, we beg to remain,

Yours ever for satisfaction and service,
JENSEN'S APIARIES.
N. C. Jensen.

Too Late for Classification.

FOR SALE—Clover (light amber) and buckwheat extracted; each in 5 and 10 pound pails. Chas. Reynders, Ulster, Pa.

FOR SALE—Choice extracted white clover honey put up in new 60-lb. cans and five-pound pails. W. X. Johnston, Pt. Hope, Mich.

WANT No. 1 extracted honey at once. State price and amount you have. E. Strudel, 1461 Richard St., Milwaukee, Wis.

FOR SALE—New crop buckwheat honey in 60-lb. cans, two to the case. D. L. Woodward, Clarksville, N. Y.

FOR SALE—50 colonies of bees in 8-frame, 3-story hives; also 50 colonies of bees in 10-frame, 3-story hives. All are heavy with honey and bees. James Dillon, Thornton, Calif.

YOUR trade demands the best. Several tons of finest extracted honey for prompt delivery, packed right, priced right. Bee-dell Apiaries, Earlville, N. Y.

FOR SALE—20,000 lbs., 1921 crop, extracted honey in new 60-lb. tins. Fine quality white clover, 13c; light amber, 11c; amber, 10c. J. G. Burtis, Marietta, N. Y.

STATEMENT OF OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., OF GLEANINGS IN BEE CULTURE, PUBLISHED MONTHLY AT MEDINA, OHIO, REQUIRED BY THE ACT OF AUGUST 24, 1912.

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Sworn to and subscribed before me this 20th day of September, 1921.

H. C. WEST, Notary Public.

Every Step in Beekeeping

By Benjamin Wallace Douglass

A brand-new book based on the most up-to-date scientific information and thorough practical experience that tells how to keep bees for profit.

A book of directions, every step made clear, so that the beginner may start right and go forward without floundering. Delightfully written. Author was formerly State Entomologist of Indiana and has been a successful beekeeper for years.

Illustrated with thirty-one photographs. Price $2.50. Sent postpaid on approval to any subscriber if the name of this paper is mentioned.

THE BOBBS-MERRILL CO.
Vermont Plaza, Indianapolis, Ind.

Northwestern Headquarters for Italian Queens

The queen is the life of the colony. You cannot afford to keep poor queens or a poor strain of bees. I have been in the bee business for more than twenty years and have made every effort to improve the honey-gathering qualities of my bees by purchase of breeders and by select breeding. I believe that my bees are unsurpassed by any. When you buy Untested Queens from me you are getting select untested queens. I will begin mailing queens about June 1.

PRICES: June 1 to October 1: Untested Italian Queen—1, $1.50; 6, $7.50; 12, $14.00; 50, $55.00; 100, $105.00. Tested Italian Queen—1, $2.50; 6, $13.50.

I have no pound packages or nuclei for sale.

J. D. HARRAH
ROUTE 1, FREEWATER, OREGON.

Southern Headquarters

Package Bees - Reliable Queens

Three-Banded Italians Only

WE solicit your orders for 1922 shipping. We have the stock, and the equipment, and experience necessary to handle your order, whether large or small, promptly and in a satisfactory manner. We have more than 1000 big, healthy colonies of hustling, pure Italian bees to draw from. All packages are headed with large, vigorous young queens of our own production. You will be pleased with the stock and service we can give you.

Write for our illustrated price list.

W. D. Achord, Fitzpatrick, Alabama

BANKING BY MAIL AT 4%

MONEY LYING IDLE or earning a small rate of interest is promoting waste. Deposit yours BY MAIL in this strong bank where it is Safe and earns 4%. Write for detailed information.

THE SAVINGS DEPOSIT BANK CO.

A. T. SPITZER, Pres.
E. R. ROOT, Vice Pres. E. B. SPITZER, Cash.

MEDINA, OHIO

Slum Gum
Old Combs

worked into beeswax at 5c per pound, minimum charge $1.00. Pay taken from wax.

Market price paid for the wax, worked into foundation, or traded for supplies.

Working Beeswax into foundation is a specialty with us.

Ship to Falconer, New York. Mark each package with your name and address both inside and outside.

Write for Red Catalog of Beekeepers' Supplies and REDUCED price list.

W. T. Falconer Mfg. Co.
Falconer, N. Y., U. S. A.

"Where the best beehives come from."

NEW ENGLAND

BEEKEEPERS will find a complete stock of up-to-date supplies here. Remember we are in the shipping center of New England. If you do not have a 1921 catalog send for one at once.

H. H. Jepson, 182 Friend St, Boston 14, Mass.

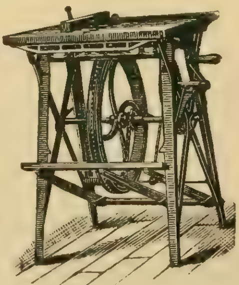
BARNES'
Hand and Foot Power Machinery

This cut represents our combined circular saw, which is made for beekeepers' use in the construction of their hives, sections, etc.

Machines on Trial

Send for illustrated catalog and prices.

W. F. & JOHN BARNES CO
545 Ruby Street
ROCKFORD, ILLINOIS



Established 1885.
Write us for catalog.

BEEKEEPERS' SUPPLIES

ALWAYS ON TOP

The Kind You Want and the Kind That Bees Need

We have a good assortment in stock of bee supplies that are mostly needed in every apiary. The A. I. Root Co.'s brand. Let us hear from you; information given to all inquiries. Beeswax wanted for supplies or cash.

John Nebel & Son Supply Co.
High Hill, Montgomery Co., Mo.

Queens of
MOORE'S STRAIN
OF ITALIANS
PRODUCE WORKERS

That fill the super quick
With honey nice and thick.

They have won a world-wide reputation for honey-gathering, hardiness, gentleness, etc. Untested queens, $1.50; 6, $8.00; 12, $15.00. Select untested $2.00; 6, $10.00; 12, $19.00.

I am now filling orders by return mail. Safe arrival and satisfaction guaranteed. Circular free.

J. P. MOORE, Queen Breeder
Route 1, Morgan, Kentucky.

Buy Your Bee Supplies Now

Take advantage of early-order discounts by ordering NOW. We guarantee to please you. "Prompt service and the very best" is our motto. *We want your beeswax and old comb.* Highest cash and trade prices offered. Texas beekeepers should write A. M. HUNT, Goldthwaite, Texas.

Manufactured by
Leahy Manufacturing Company
95 Sixth St., Higginsville, Missouri
Write for FREE catalog. It is to your interest.

GOLDEN OR THREE-BAND QUEENS.

Untested, balance of season, $1.00 each; doz. $10.00, or $80.00 per hundred. Virgins, 50c each, or $40.00 per hundred. All orders filled promptly or parties notified when to expect shipment; satisfaction.

R. O. COX, Rt. 4, Luverne, Ala.

MASON BEE SUPPLY COMPANY
MECHANIC FALLS, MAINE

From 1897 to 1921 the Northeastern Branch of The A. I. Root Company.
PROMPT AND EFFICIENT SERVICE
BECAUSE—Only Root's Goods are sold.
It is a business with us—not a side line.
Eight mails daily—Two lines of railway.
If you have not received 1921 catalog send name at once.

5 REASONS WHY---

You will want to send us the coupon at once

Money Saved Is Money Made

The A. I. Root Co. of Iowa,
Council Bluffs, Iowa.

Gentlemen:—Kindly name your fall prices of the following:

1. Eight-frame hives, metal covers, complete, sets 5 KD.
2. Eight-frame bodies, with frames, complete, sets 5 KD.
3. Shipping cases, lots of......
4. Cans, jars, pails, and second-hand 5-gal. cans.
5. Honey tanks.

Name ....

Address ....

City ....

State ....

THE A. I. ROOT CO. OF IOWA
COUNCIL BLUFFS, IOWA

To the Beekeepers Who Purchase Bees in Packages

Do not worry about *Express Charges, loss in Transit, and Delay.* We are going to do this for you.

Did you realize that a nice frame of emerging bees is equal to a pound of bees. In 1922, we will be back to pre-war price and better service.

The above is for May and June delivery, 15 per cent with order, balance 15 days before date of shipment.

2 lbs. bees, and 1 good Untested Three-banded Queen on frame of emerging bees	$6.25
3 lbs. as above	7.50
2-frame nucleus with queen	6.25
3 frame nucleus with queen	7.25

OUR GUARANTEE.

Express paid. All dead bees promptly replaced. Government health certificate with each shipment. Simply have your Express Agent sign bad-order report and mail same to us at once. You take no chance. Order now so as not to be disappointed. Write for discount on 100 or more packages.

THE HOME OF GOOD QUEENS.

OSCAR MAYEUX
HAMBURG, LOUISIANA.

Southern Headquarters

Reliable Three-Banded Italian Queens

By Return Mail

Large, vigorous, well marked. Guaranteed to please you. We can make deliveries to Oct. 20.

Untested	
Each	$1.00
Six	5.50
Twelve	10.50
Twenty-five	20.00
Fifty	38.00
Tested	
Each	$1.75

Safe arrival and satisfaction guaranteed.

W. D. ACHORD
FITZPATRICK, ALA.

A Superior Quality at Less Cost

SUPPLIES

A Superior Quality at Less Cost

These supplies are made by the Diamond Match Co., and are of a superior quality. Hives, Supers, etc., listed below, are in the flat, and are complete with Hoffman frames, metal rabbets, and all inside fixtures.

One-Story Dovetailed Hives

Five 8-frame	$13.50
Five 10-frame	14.30

Shallow Extracting Supers.

Five 8-frame	$5.00
Five 10-frame	5.50

Full-Depth Supers

Five 8-frame	$6.70
Five 10-frame	7.60

No. 1 Style Comb Honey Supers.

Five 8-frame	$4.80
Five 10-frame	5.25

Standard Hoffman Frames.

100	$7.20
500	33.00

Our Incomparable Quality Foundation

Medium Brood

5 lbs.	74c per pound
25 lbs.	73c per pound
50 lbs.	72c per pound

Thin Super

5 lbs.	80c per pound
25 lbs.	79c per pound
50 lbs.	78c per pound

Light Brood

5-lb. lots	76c per pound
25-lb. lots	75c per pound
50-lb. lots	74c per pound

Aluminum Honeycombs as now made by Duffy-Diehl Co. are meeting with success. We carry these in stock to supply Eastern beekeepers.

HONEY! HONEY! HONEY!

Beekeepers who are suppying Honey to a regular family trade, or who are located along the highways, and are supplying motorists, know that their customers want a honey of a uniform color and flavor. And unless the honey is at all times uniform in color and flavor, customers sometimes become dissatisfied. Our special blend of Fancy Honeys (liquid) is always uniform and is of a fine mild flavor, and will satisfy the most exacting trade.

Special Blend of Fancy Honey (Liquid)

60-lb. Tins, 2 per case	14c lb.
10-lb. Tins, 6 per case	16c lb.
5-lb. Tins, 12 per case	17c lb.
2½ lb. Tins, 24 per case	18c lb.

Various Grades, Crystallized, 60-lb. Tins

Water White Orange	14c lb.
Water White Sweet Clover	12c lb.
Extra Light Amber Sage	11c lb.
N. Y. State Buckwheat	10c lb.

Pure Vermont Maple Sap Syrup, case of 12 5-pound tins, $14.00.

GLASS AND TIN HONEY CONTAINERS

2½-lb. Cans, 2 dozen reshipping cases, $1.45 case; crates of 100	$ 6.50
5-lb. Pails (with handles), 1 doz. reshipping cases, $1.35 per case; crates of 100	8.30
10-lb. Pails (with handles), ½ doz. reshipping cases, $1.10 case; crates of 100	12.75
60-lb. Tins, 2 per case—NEW, $1.30 case; USED	.30

White Flint Glass, With Gold Lacquered Wax Lined Caps.

8-ounce Honey Capacity, Cylinder Style	$1.50 per carton of 3 dozen
16-ounce Honey Capacity, Table Jar Service	$1.40 per carton of 2 dozen
Quart or 3-pound Honey Capacity, Mason Style	$1.00 per carton of 1 dozen

HOFFMAN & HAUCK, INC.

WOODHAVEN, NEW YORK

Make Your Bees Pay!

If you want bigger honey profits, **get the best queens you can buy.** This is the secret of successful bee-raisers. Hundreds of America's greatest honey producers order Forehand's 3-banded Italian Queens. Follow their example. Order from Forehand and be sure of satisfactory results. Backed by 28 years' successful experience in queen-breeding and honey production. Take no chances. Experimenting is costly. So certain am I that my queens will satisfy you, that I will gladly replace unsatisfactory queens delivered in U. S. or Canada, or refund your money. You be the judge and jury. Can anything be fairer?

Prices August 1st to Nov. 1st.

	1	6	12
Untested	$1.00		$10.00
Selected Untested	1.25		12.00
Tested	2.50	$13.00	24.00
Selected Tested	3.00	16.50	30.00

Bees in two-pound packages: 1 package, $6.00; 25 or over, $5.80; 50 or over, $5.40; 100 or over, $5.00, without queens.

Place your order now. Prices low, quality considered. Write for circular and discount on large orders.

N. Forehand

Ramer, Alabama

Breeder of 3-banded Italian Queens Exclusively.

1922 PRICES

Booking Orders Now

SOUTHLAND BEES & QUEENS

Are Guaranteed to Please You

POUND PACKAGES—Shipped on Comb of Foundation

1-lb. package, with queen	$4.00	25 or more	$3.50
2-lb. package, with queen	6.00	25 or more	5.50
3-lb. package, with queen	8.00	25 or more	7.50

NUCLEI

1-fr. nucleus, with queen	$4.00	25 or more	$3.50
2-fr. nucleus, with queen	5.50	25 or more	5.00
3-fr. nucleus, with queen	7.00	25 or more	6.50

Special prices on large orders. Terms: 25% deposit to book your order.

BEEKEEPERS' SUPPLIES

Lightening Service on Root Quality Supplies. Discount large orders. Shipment from here or factory. Write for catalogue.

THE SOUTHLAND APIARIES

BOX 585 **HATTIESBURG, MISS.**

Guaranteed Hubam Clover

Annual White Sweet Clover (Hughes Variety)

All of the annual white sweet clover seed of the 1920 crop was exhausted before May 1st. But seed of an early strain, planted in Texas after Christmas, 1920, began to reach maturity early in May. This seed is now available.

You can get it in time to test it this year. It blooms for bees in three or four months, and continues to bloom for a much longer period than most plants used for the purpose. Many beekeepers have declared it to be the greatest clover yet tried. It combines quick growth with an unusual wealth of honey-making blooms. It is also a legume that returns a large amount of plant food to the soils. It has frequently been described editorially by Gleanings in Bee Culture.

Big profits are possible growing seed for your neighbors, and the farmers and beekeepers of your locality.

The price is now $5.00 a pound. Order from the Henry Field Seed Co., Shenandoah, Iowa, or direct from the grower who guarantees.

The De Graff Food Company, Seed Dept. 303
De Graff, Ohio

The "BEST" LIGHT

Positively the cheapest and strongest light on earth. Used in every country on the globe. Makes and burns its own gas. Casts no shadows. Clean and odorless. Absolutely safe. Over 200 styles. 100 to 2000 Candle Power. Fully Guaranteed Write for catalog. AGENTS WANTED EVERYWHERE.

THE BEST LIGHT CO.
306 **E. 5th St., Canton, O.**

INDIANOLA APIARY

is now booking orders for 1922 for Italian bees and queens. Write for price list and circular. No disease. Bees inspected by State inspector.

J. W. SHERMAN
Valdosta, Ga.

FOR YOUR 1921 CROP

Comb honey shipping cases, honey cans, friction-top pails. Price on application.

Early order cash discount on sections, hives, supers, frames, comb foundation, and other goods.

Buy now and get supplies ready for 1922. Make out your list, and send for our prices.

AUGUST LOTZ COMPANY, BOYD, WIS.

IT'S HERE!
WE HAVE IT!
QUALITY
BEE SUPPLIES

Polished Shipping Cases

One-piece covers and bottoms, glass, paper, and nails included. Selling at cost prices, as follows:

24-lb. for 1⅞ sections,
$30.00 per 100.

12-lb. for 1⅞ sections,
$17.00 per 100.

Write for illustrated catalog on our bee supplies. We are always ready to serve you.

CHAS. MONDENG
146 Newton Ave. N. and
159 Cedar Lake Rd.
MINNEAPOLIS, MINNESOTA.

Beeswax Wanted

In big and small shipments, to keep Buck's Weed-process foundation factory going. We have greatly increased the capacity of our plant. We are paying higher prices than ever for wax. We work wax for cash or on shares.

ROOT BEE SUPPLIES

Big stock, wholesale and retail. Big catalog free.

Carl F. Buck
The Comb-foundation Specialist
AUGUSTA, KANSAS
Established 1899.

Completely Destroys the Weed Growth

More than that, the BARKER breaks the hardest crust into a level, porous, moisture-retaining mulch — **all in the same operation.**

A ten-year-old boy can run it—do more and better work than ten men with hoes. Saves time and labor, the two big expense items.

BARKER WEEDER, MULCHER AND CULTIVATOR

Eight reel blades revolve against a stationary underground knife—like a lawn mower. **BEST WEED KILLER EVER USED.** Works right up to plants. Cuts runners. Aerates the soil. Has leaf guards, and shovels, for deeper cultivation—3 *garden tools in* 1.

FREE ILLUSTRATED BOOK.

Tells how gardeners and fruit-growers everywhere are reducing their work; increasing their yields.—How to bring growing plants through a dry season.—How to conserve the moisture and force a larger, more rapid growth. Send TODAY for this free, illustrated book and special Factory-to-User offer.

BARKER MANUFACTURING COMPANY

Dept. 28. David City, Neb.

Barker Mfg. Co., Dept. 28, David City, Neb.
Gentlemen:—Send me postpaid your free book and Factory-to-User offer.

Name.......................

Town...............

State...............

R. F. D. or Box.........

13,019 QUEENS

Reared to September first with conditions extremely favorable for the production of good queens. Every colony requeened now and successfully wintered means a colony headed in the spring with a young queen of superior stock. DO IT NOW, especially if they will have time to rear a set of brood. One untested, $1.00, 12 or more, 75c ea.

We are now booking orders for spring delivery of Superior Italian Bees and Queens.

We can furnish you from one to six car loads of full colonies of Italian bees in good hives (new if preferred) with any kind of equipment that you might desire at the right price. Write us what you will need.

4,000 nuclei or 4,000 packages. We can supply your wants. If our prices decline prior to time of shipment, you will have the difference refunded you, but if they advance you will get your bees at the same price.

Cypress Bee Supplies.

Let us supply you with your cypress hive-bodies, bottom-boards, and covers or anything that you might be interested in. You will be surprised at both the quality and the price.

THE STOVER APIARIES, MAYHEW, MISSISSIPI

QUEENS FULL COLONIES AND NUCLEI QUEENS

Our bees are hustlers for honey, prolific, gentle, very resistant to European Foul Brood, our customers tell us. For years we have been shipping thousands of queens and pounds of bees all over the U. S. A. and Canada. We are continually getting letters with statements such as the following: “Well pleased with your stock,” “Best we ever had,’ ’“The bees we got from you are the tops (best) we have in our 225 colonies,” “Bees arrived in fine shape, well pleased,” etc., etc. Write for circulars giving details, etc. We are quoting a lower price for balance of the year, but will still hold up the high standard of quality.

I have a good proposition for 2 or 3 Northern beekeepers that would like to come South this fall. Write for particulars.

QUEENS AFTER JULY 1st, BALANCE OF THE YEAR:

Untested	$1.35 each;	25 or more, $1.00 each	1 lb. of bees..	$2.25 each;	25 or more, $2.13 each
Select Unt. . .	1.50 each;	25 or more, 1.25 each	2 lbs. of bees..	3.75 each;	25 or more, 3.56 each
Tested	2.25 each;	25 or more, 1.75 each	3 lbs. of bees..	5.25 each;	25 or more, 4.98 each
Select Tested..	2.75 each;	25 or more, 2.00 each	Add price of queen wanted when ordering bees.		

Safe arrival guaranteed within six days of here.

MY FREE CIRCULARS FOR 1922 SHIPPING, quoting lower prices for package bees and queens, are ready to mail. Send for one before placing your order.

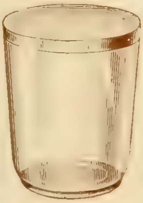
One of my customers from Canada wrote he was getting an average of over 200 lbs. this year from bees bought of me last year. Another wrote he was getting 90 pounds this year from packages bought this spring.

NUECES COUNTY APIARIES

E. B. AULT, Prop. **CALALLEN, TEXAS**

Packing, Shipping and Labeling

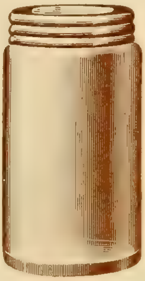
To ship safely, you must pack well. To sell to best advantage, your honey must be put up in attractive containers that are attractively labeled. We have the best of all kinds of honey packages for you—everything to make your shipping safe, and your honey attractive whereve and however sold.



GLASS TUMBLERS.

Our 6½-oz. size tumber is used extensively wherever a small package of honey is required. Tumblers have tin caps and waxed paper for making a tight seal. Packed complete in boxes or barrels at the following prices:

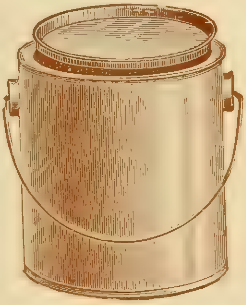
Cat. No.		Weight	Price
B442102	—6½-ounce tumblers, 48 to case........	20 lbs.	$1.65
B442103	—6½-ounce tumblers, 480 to barrel.....	190 lbs.	14.80



16-OUNCE ROUND JARS.

Extracted honey will sell readily in a neat, attractive, leakproof glass container. A little money saved on your glass containers often prevents repeat orders for your goods. We have sold large quantities of these jars and we fully recommend them as being the best honey package, price considered, on the market today. Give us your order and see how fast your honey will sell when put in this container.

B442101—16-ounce round jar, weight per case of 24, 18 lbs., per case $1.70



FRICTION-TOP CANS AND PAILS.

For retailing honey in large packages direct to the consumer we know of nothing better than the friction-top cans and pails.

Cat. No	Size of Containers	Weight	Price
B442018	—2½-lb. can, box of 24............	16 lbs.	$1.60
B442025	—2½-lb. can, carton of 116........	35 lbs.	5.00
B442026	—5-lb. can, carton of 50...........	25 lbs.	4.00
B442020	—5-lb. can, box of 12..............	16 lbs.	1.45
B442021	—10-lb. pail, box of 6........:....	15 lbs.	1.20
B442027	—10-lb. pail, carton of 50..........	45 lbs.	6.00

SHIPPING CASES.

Our regular cases are single tier for 24 sections. When in flat, nails and two-inch glass strips with grooved wood strips and end-blocks, are included. Corrugated paper in bottoms, tops, and ends. Several special bargains. Write for prices.

CARTONS AND LABELS.

An attractive and sanitary carton is absolutely necessary to secure the top price for comb honey. We have a very handsome new folding carton that you will surely want to try, if you produce comb honey. Other cartons of all kinds. All kinds, sizes, and prices in honey labels, for all sorts of honey packages. Write for our illustrated honey-label catalog. If you are a home or roadside seller of honey, you will certainly want our new embossed metal sign, "Honey for Sale," 8 by 14 inches, white letters on blue background, $1.00 postpaid.

Write today for our special price list on Equipment for Packing, Shipping and Labeling. If you have honey to bottle, pack or ship, you will want this special list.

THE A. I. ROOT COMPANY
MEDINA, OHIO

And Now Prepare for Winter

If you will be forehanded, begin now to get your bees in shape for winter. Young queens, plenty of young bees, ample stores, and efficient protection from winter winds are acknowledged requisites.

Stores can be added by sugar later if necessary; ample protection will be your fall efforts. But young bees and plenty of them can only be secured by prolific laying of a vigorous queen in combs of worker-cells.

If you have been forehanded, you will have used DADANT'S FOUNDATION in starting your combs, thus insuring maximum results in this line.

REMEMBER: Drone comb can profitably be replaced almost any time during a honey flow by DADANT'S FOUNDATION, thus bringing your colonies to maximum producing ability.

DADANT'S FOUNDATION—Every inch, every pound, every ton, equal to any sample we have ever sent out. Specify it to your dealer. If he hasn't it, write us.

DADANT & SONS, HAMILTON, ILL.

Catalog and Prices on Bee Supplies. Beeswax, Wax Working into Comb Foundation, and Comb Rendering for the asking.

Massachusetts
NOV 2 - 1921
Agricultural
College

Gleanings in Bee Culture

November chill blaws loud wi' angry sugh;
The short'ning winter day is near a close.
Robert Burns

VOL. XLIX NOVEMBER, 1921 NUMBER 11

Queens

We are now in a position to accept orders for queens in large quantities. Each queen selected and prepared for mailing by Henry Perkins, our Queen-breeder. They are going out in every mail, and to have yours in time to use this season, better get your order in the next mail.

Prices on bee supplies cut to pre-war time. Write for quotations.

Miller Box Manufacturing Co.

201-233 N. Avenue Eighteen
Los Angeles, Calif.

"Griggs saves you freight."

TOLEDO

By the time you read this our 1921 crop will be history. How about your Honey Cans, Comb-honey Cases, Extractors? Let us know your wants. We can serve you promptly and well.

Honey, New Crop

Send sample and say how much you have, kind, how packed, and price asked in first letter.

Beeswax always wanted.

THE GRIGGS BROS. CO.

Dept. 25 Toledo, O.

"Griggs saves you freight."

Bee Hives & Frames

Below Cost

Lumber prices are lower. We are pricing our goods on the basis of present lumber costs with a narrow margin of profit, which means that goods on hand made from lumber bought at high prices are being sold below cost.

Send for new condensed price list. Give us a list of goods needed and get our prices. We want to serve you.

THE A. I. ROOT COMPANY
OF CALIFORNIA
1824 E. 15th St., Los Angeles
52-54 Main St., San Francisco

QUALITY
TIN CANS
FIRST
For PACKERS and MANUFACTURERS of FOOD PRODUCTS
LARGE CAPACITY
LONG EXPERIENCE
YOUR INQUIRIES SOLICITED
W. W. BOYER & CO. INC.
BALTIMORE, MD.

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Editorial Staff

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A. I. Root, Editor Home Dept.
H. H. Root, Assistant Editor
H. G. Rowe, M'n'g Editor

Honey ***Wanted*** *Honey*

We are in the market for both comb and extracted. Send sample of extracted, state how put up, with lowest price, delivered Cincinnati. Comb honey, state grade and how packed, with lowest price, delivered Cincinnati. We are always in the market for white honey, if price is right.

C. H. W. Weber & Co.
2163-65-67 Central Av., Cincinnati, Ohio

HONEY CANS

Several carloads just received at our Ogden and Idaho Falls warehouses. We also manufacture shipping cases and beehives. Special prices on request. "Everything in Bee Supplies." Prompt shipments.

SUPERIOR HONEY CO., OGDEN, UTAH
(Manufacturers of Weed Process Foundation.)

Indianapolis Can Give You Some Real Beekeeping Service

WE SHIP YOUR ORDER THE SAME DAY IT IS RECEIVED. LET US GIVE YOU SOME OF THIS SERVICE. CATALOG FOR THE ASKING. WRITE FOR PRICES ON BEESWAX.

THE A. I. ROOT COMPANY
873 Massachusetts Avenue, Indianapolis, Ind.

Have You Sold Your Honey?

We are buying COMB and EXTRACTED honey. Send us a sample and tell us what you have to offer. Name your most interesting price delivered to Cincinnati. Remittance goes forward the day shipment is received.

Old Comb—Don't forget we render wax from your old combs and cappings. Write us for shipping tags.

* * * * * * *

We Offer You Friction-Top Cans

2½-lb. cans	$ 4.25 per 100	$ .50 per 10
5 -lb. cans	8.00 per 100	1.00 per 10
10 -lb. cans	12.00 per 100	1.40 per 10

1-lb. Round Screw Top Jars, 2 doz. in shipping case,
10-case lots..........$1.60 per case.

Prices cash with order, f. o. b. Cincinnati.

* * * * * * *

THE FRED W. MUTH CO.

Pearl and Walnut Streets. Cincinnati, Ohio.

IT'S HERE! WE HAVE IT!

QUALITY BEE SUPPLIES

Polished Shipping Cases

One-piece covers and bottoms, glass, paper, and nails included. Selling at cost prices, as follows:

24-lb. for 1⅞ sections,
$30.00 per 100.

12-lb. for 1⅞ sections,
$17.00 per 100.

Write for illustrated catalog on our bee supplies. We are always ready to serve you.

CHAS. MONDENG

146 Newton Ave. N. and
159 Cedar Lake Rd.
MINNEAPOLIS, MINNESOTA.

Beeswax Wanted

In big and small shipments, to keep Buck's Weed-process foundation factory going. We have greatly increased the capacity of our plant. We are paying higher prices than ever for wax. We work wax for cash or on shares.

ROOT BEE SUPPLIES

Big stock, wholesale and retail. Big catalog free.

Carl F. Buck

The Comb-foundation Specialist
AUGUSTA, KANSAS
Established 1899.

HONEY MARKETS

U. S. Government Market Reports.

SHIPPING POINT INFORMATION (FIRST HALF OF OCTOBER.)

CALIFORNIA POINTS.—The honey market has been very quiet during past two weeks. Demand is falling off sharply, but prices remain firm on account of light California crop and limited supplies of light-colored honeys on hand. Supplies of amber grades fairly liberal. The lower grades of honey enter into competition with sugar to some extent; but higher grades sell strictly on their own merits as honey. Carloads f. o. b. usual terms at loading points, per lb., white orange blossom, dealers holding for 12-12½c, white sage 11-12c, light amber sage 7½-8½c, old crop white sage 10½c, light amber alfalfa 6½. Hawaiian, amber offered at 4½c. Beeswax: Practically no demand nor movement. No sales reported.

INTERMOUNTAIN REGION.—Supplies of honey are still very large, altho large shipments have already rolled to eastern markets. The movement during the past month has been considerably heavier than during the corresponding period last year. Judging from the amount of inquiries received, more interest has been shown in extracted honey than at any time since the spring of 1920. The demand for comb has also been good. Extracted white sweet clover and alfalfa f. o. b. shipping points, is reported to have sold for 7-8½c, mostly 7-8c per lb. in carlots, and up to 10c in less than carlots. White comb honey has sold at $4.85-5.50 for No. 1 and fancy in carlots, with few sales higher, and some beekeepers receiving down to $4.50 for No. 1 stock. Beeswax is moving slowly at around 22c cash or 24c per lb. in trade.

EAST CENTRAL STATES.—Offerings of both extracted and comb have been liberal, both to the large buyers and in a retail way. Bottling plants are working to capacity and large quantities are going direct to the consumer. It is said that the demand for retail glass and tin containers thruout the clover belt has been the largest ever known. Colonies are reported in good shape, except for prevalence of American foul brood in some sections. In the northern portion of the section, bees have been rearing brood heavier this fall than usual, and unless they are fed many colonies will go into winter quarters light in stores. Prices show little change during the past two weeks, ranging 8-10c per lb. for carlots of white clover extracted, and 12-15c per lb. for small lots of 60-lb. cans of white clover, basswood, and raspberry. White comb, No. 1 grade, in 24-section cases, has been bought at $4.00-4.50 per case in carlot quantities, and up to $6.00 per case in case lots to retailers. Dark-colored and No. 2 comb sell at a dollar per case discount.

PLAINS AREA.—Due to the crop failure, honey is being shipped in to supply the demand, at good prices. It is said that westward shipments are even being made from New York State, an unusual proceeding. Local white sweet clover has been selling at 10-12c per lb., and white clover at 12c. Last year's crop of white clover has been offered at 10c per lb.

NORTHEASTERN STATES.—The fairly good fall crop has assisted in making up for the lighter earlier honey flow. Domestic prices at large eastern consuming centers somewhat affected by low quotations on West India stock. White clover and basswood has sold in large lots at 10c per lb., and buckwheat at 8c. The demand for supplies is reported as exceptionally good, indicating increased beekeeping activity next season. Bees are in good condition, except for an unusual amount of moth. American foul brood is in evidence in some sections.

SOUTHERN UNITED STATES.—The late fall flow has enabled bees to gather stores for winter, and has helped out the earlier crop failure in much of the southeast, caused by unfavorable weather conditions. Extracted sweet clover in Alabama has recently sold for 10c per lb. In Texas extracted honey has been moving rapidly at 9½c per lb. Colonies in the State are reported in normal condition.

TELEGRAPHIC REPORTS FROM IMPORTANT MARKETS.

BOSTON.—1 car Porto Rico via New York, 1 car California by boat, and approximately 150 cases Vermont and 30 cases New York arrived since last report. Good demand for Porto Rico and moderate demand for other extracted stock. Comb honey in slow demand. Old crop comb nearly cleaned up, new comb lower. Comb: Sales to retailers, Vermont, 20-section cases No. 1 white clover, best fancy stock in cartons $7.00-7.50, some light weight sections $5.00-6.50. New York, 24-section cases No. 1 white clover $6.00-7.00, light low as $5.00. Extracted: Sales to confectioners and bottlers, Porto Rico, amber 75-85c per gal. California, white sage 14-16c per lb. Brokers l. c. l. sales, delivered Boston basis, California, new crop white sage 12, light amber sage 10c per lb.

CHICAGO.—Arrivals since last report, 1 car Idaho, 1 car Arizona, and 1 car Minnesota. Supplies liberal. Market about steady. Comb honey moving slowly but more activity reported in extracted market. Extracted: Sales to bottlers and confectionery manufacturers, Wisconsin, white basswood and clover 14c. Michigan and Iowa, clover and raspberry white 12-13c, light amber 11c. Comb: Sales to retailers, Michigan, Ohio, and Minnesota, 24-section cases white clover No. 1, $6.00-6.25; No. 2, $4.00-5.25. Beeswax: Receipts of domestic moderate; receipts of foreign wax reported falling off. More activity to market but prices are practically unchanged. Sales to harnessmakers, ship supply houses, and wholesale druggists, Oklahoma, Missouri, and Texas, light 29-31c, dark 26-28c. African, light 22-24c, dark 18-20c. Foreign wax has wide range in quality, mostly showing heavy percentage of foreign matter.

CINCINNATI.—1 car Utah arrived since last report.

MINNEAPOLIS.—1 car California arrived since last report. Comb: Sales direct to retailers, supplies moderate, demand and movement light, market steady. Colorado, 24-section cases mixed alfalfa and sweet clover No. 1, $7.00. Extracted: Supplies moderate. Demand and movement slow, market dull. Sales direct to retailers, Minnesota, white clover 11-13c per lb.; California, white orange blossom no sales, asking 17½c per lb.

NEW YORK.—Domestic and foreign receipts limited. Supplies limited, demand moderate, movement limited, market steady, slightly easier tendency. Extracted: Spot sales to jobbers, wholesalers, confectioners, bakers, and bottlers, domestic per lb., California, white sweet clover 9½-10c, white sage 11-12c, mostly 11½c. New York, white clover 9½-10c, buckwheat 8-8½c, few 9c; South American and West Indian, refined mostly 70c per gal. or 6-6½c per lb. Beeswax: Foreign receipts moderate, supplies moderate, demand and movement limited, market dull, easier feeling. Spot sales to wholesalers, manufacturers and drug trade, South American and West Indian, crude light best 23-24c, few 25c, slightly darker 20-22c, dark 13-15c. African, dark 13-15c, few 16c per lb.

PHILADELPHIA.—Arrivals since last report: 1 car Wyoming and 1 car New York. Receipts moderate. Demand and movement slow, market steady. Extracted: Sales to jobbers, bakers, and wholesale grocers, Wyoming, white sweet clover and alfalfa in 5-gal. cans 9½c per lb. New York, white clover 9c per lb. Beeswax: Receipts light. Demand and movement slow, market steady. Sales to manufacturers, per lb., South American, crude light 25-26c, slightly darker 22-23c; African, dark 14½-15c.

ST. LOUIS.—Light receipts of nearby comb and moderate receipts of southern extracted reported. Demand and movement improving considerably, market steady. Sales direct to retailers in small lots, comb: 24-section cases nearby and southern, light amber various mixed flavors No. 1, $6.50-7.00 per case. Extracted: In 5-gal. cans, southern, light amber various mixed flavors 7-9c per lb., dark and inferior nominally 1-1½c per lb. less. California, light amber alfalfa mostly around 7½-8c per lb. Beeswax: Receipts reported very light. Movement limited and market dull on sales to jobbers basis. Market is nominally quoted at 23c per lb. for southern ungraded average country run.

KANSAS CITY.—Two cars Idaho arrived since last report. Supplies moderate. Demand and movement moderate, market steady on both comb and extracted. Sales to jobbers; extracted: Colorado, white alfalfa 12c, extra light amber alfalfa 10-11c per lb. Comb: Nevada and Colorado, 24-section cases No. 1 white alfalfa and sweet clover $6.00 per case.

H. C. TAYLOR,
Chief of Bureau of Markets.

Opinions of Producers.

Early in October we sent to actual honey-producers and to some associations the following questions:

1. What is the total average production per colony to date for 1921 in your locality? Give answer in pounds.
2. How does this compare with normal for your locality? Give answer in per cent.
3. What is the condition of the colonies in your locality compared with normal as to (1) Number and ages of bees, (2) Stores for winter. Give answer in per cent.
4. What is the condition of the honey plants for next season at this time compared with normal?
5. What price are producers receiving for the new crop at their station when sold to large buyers? (1) Comb honey? Extracted honey?
6. What are prices to retailers in small lots? (1) Comb honey fancy or No. 1 per case? (2) Extracted honey in five-pound packages?
7. How is honey now moving on the market in your locality? Give answer in one word, as slow, good, rapid.

From Producers' Association.

The season for honey sales opened with a rather brisk demand for comb honey and this is now steadying down to a somewhat lower price, but it looks as if all of the comb honey produced could readily be sold at a fair price.

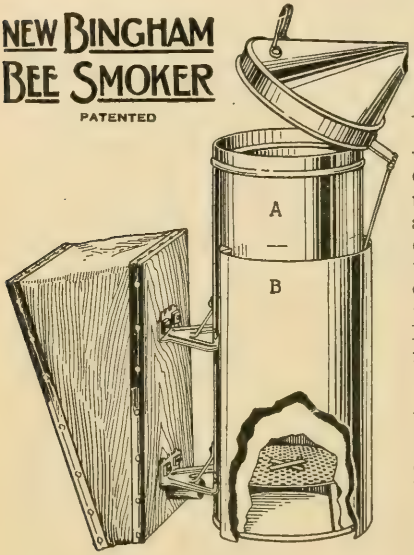
The extracted honey situation has surely sur-

(Continued on page 721.)

		Crop		*Condition*			*In large lots*		*To Retailers.*		
State.	*Reported by*	*Lbs.*	*Percent.*	*Bees.*	*Stores.*	*Plants.*	*Comb.*	*Extr.*	*Comb.*	*Extr.*	*Movem't.*
Alabama.	J. M. Cutts	17	40	100	125	80	$4.80	$.08	$6.00	$.50	Slow
Arkansas	J. Johnson	48	150	100	100	100			6.00		Good
Arkansas	J. V. Ormond		75	125	125	100			.30	1.10	Good
B. C.	W. J. Sheppard	30	50	100	100	100	7.20	.25		1.75	Slow
California	L. L. Andrews			75	60	100		.10		.90	Good
California	G. B. Larinan		20	100	100	100		.10			Fair
California	M. A. Saylor	40	75	80	80	100	2.88	.06	3.00	.75	Good
Colorado	B. W. Hopper	30	30	80	90	100	5.00	.09	6.00	.80	Good
Connecticut	A. Latham	45	75	100	100	100	5.25	.17	8.00	1.50	Good
Connecticut	A. W. Yates	25	50	100	100	70			8.00	1.00	Slow
Florida	C. C. Cook	70	100	100				.15			Good
Florida	H. Hewitt	40	75	100	100	100		.08		.85	Slow
Florida	W. Lamkin	50	75	100	100	100	2.16		.13	.65	Good
Georgia	J. J. Wilder	10	100	100	100	100	5.00	.10	6.00	.80	Slow
Illinois	C. F. Bender	40	75	100	100	100			6.00		Fair
Illinois	A. L. Kildow	75	100	110	100	90	5.75	.15	7.00	1.00	Good
Indiana	T. C. Johnson	60	90	100	100	125			5.50	1.00	Good
Indiana	E. S. Miller	100	100	100	100	100			6.00	1.25	Good
Indiana	J. Smith	25	50	100	75	100			8.00	1.25	Good
Iowa	F. Coverdale	1	2	100	75	80		.17			
Iowa	W. S. Pangburn	17	10	100	50	100			6.00	.90	Good
Iowa	C. D. Mize	60	60	100	75	100			6.00	.90	Good
Louisiana	E. C. Davis	80	100	100	100	100	5.50	.06	6.00	.55	Slow
Maine	O. B. Griffin	40	70	90	90	87	7.20	.25	.30	1.25	Slow
Maryland	S. J. Crocker, Jr.	0		100	100	90	5.72	.13	6.00	1.25	Slow
Massach'tts	O. M. Smith	50	50	100	100	100					Slow
Michigan	I. D Bartlett	65	65	125	125	100			4.75	.75	Good
Michigan	B F. Kindig	110	140	100	150	125	5.72	.12	6.50	1.00	Good
Michigan	E. D. Townsend	60	100	100	100	80		.13		1.25	Good
Michigan	F. Markham	140	140	100	125	125			6.00	1.25	Good
Mississippi	R. B. Williams	50	80	125	125	100	5.00	.09	5.15	.75	Good
Missouri	J. H. Fisbeck	60	100	100	75	100				1.25	Slow
Missouri	J. W. Romberger	12	20	60	85	60					Slow
Montana	R. A. Bray	100	90	100	115	95	5.50	.12	6.25	.80	Good
Nevada	L. D. A. Prince			100	40	100	5.00	.08	6.25	.75	Slow
Nevada	E. G. Norton	50	70	100	100	100		.08		.50	Slow
New York	Adams & Myers	35	50	85	50	25	5.00	.10	6.50	1.00	Good
New York	G. B. Howe	30	50	110	110		6.00	.15	6.00	.85	Fine
New York	F. W. Lesser	90	100	100	100	75	5.25	.10			Rapid
New York	G. H. Rea	50	50	95	100	50	4.50	.09	6.50	1.10	Good
New York	O. J. Spohn	100	80	95	95	100					Good
New York	N. L. Stevens	100	125	95	90	75		.08	5.00	.75	Good
N. Carolina	W. J. Martin	25	25	100	95	100	6.00	.11	7.50	1.25	Slow
N. Carolina	C. L. Sams	22	40	100	80	100	6.00	.10	8.40	.60	Slow
N. Carolina	C. S. Bumgardner			100	80	100					Good
Ohio	E. G. Baldwin	125	133	125	125	80	5.28	.09	.30	1.00	Slow
Ohio	R. D. Hiatt	133	150	100	80	85			6.00	1.20	Good
Ohio	F. Leininger	130	100	100	75	90	4.32	.10	4.50	.75	Good
Ohio	J. F. Moore	100	167	100	100	90		.11	5.00	.95	Good
Oklahoma	J. Heneisen	20	30	60	80	75					
Oklahoma	C. F. Stiles	10	20	85	70	100			7.00	1.25	Slow
Oregon	E. J. Ladd	70	100	100	100	90	6.50	.11	8.00	.95	Slow
Oregon	H. A. Scullen	30	50	100	75	80	6.75	.13	7.25	1.00	Good
Pennsyl.	H. Beaver	80	100	100	100	80	4.25	.09	4.50	.75	Good
Pennsyl.	C. N. Greene	35	75	100	90	95			6.00	.75	Slow
Pensyl.	D. C. Gilham	40	100	105	100				8.80	1.40	Slow
Rhode Isl.	A. C. Miller	10	30	105	100	100				1.25	Good
S. Carolina	E. S. Provost	20	75	90	90						Good
Texas	T. A. Bowden	30	50	80	80	90				.80	Slow
Utah	M. A. Gill	130	110	90	100	85	4.50	.08	.25	.60	Good
Vermont	J. E. Crane	20	40	100	125	90			6.50	1.10	Slow
W. Virginia	W. C. Griffith	96	200	110	110	100			4.00	1.00	Good
Washington	G. W. B. Saxton	70	100	100	100	100		.11		1.10	Slow
Washington	G. W. York	75	60	80	75	85	5.25	.10	6.25	.95	Slow
Washington	W. L. Cox	30	35	100	100	100	6.00	.12	7.00	.80	Slow
Wisconsin	N. E. France	17	25	100	75	105		.17			Good
Wisconsin	E. Hassinger, Jr.	45	70	100	100	50		.13		.85	Rapid
Wisconsin	H. F. Wilson		25	100	95	100	6.72	.15	7.00	1.25	Good

Bingham's Big Smoke Smoker

NEW BINGHAM
BEE SMOKER
PATENTED



Wins Contest at New York State Beekeepers' July Meeting.

Gilbertsville, N. Y., Oct. 3rd, 1921.

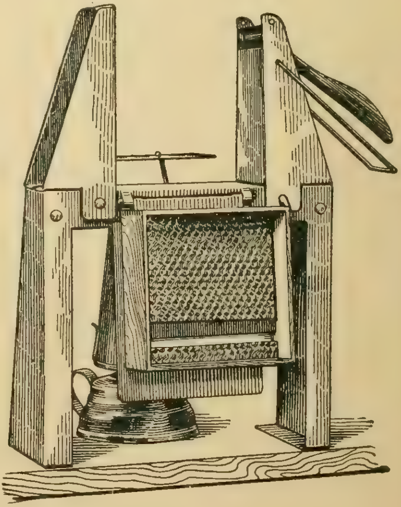
A. G. Woodman Co.:

Last winter I bought a copper Big Smoke Smoker with shield of you and in July took the same to the Chenango County beekeepers' picnic and entered the Smoker contest. There were nine contestants and the Big Smoke won the prize, which was a fine queen bee. Needless to say, I was very proud of the victory. They gave us one minute, and at the expiration of thirty-five minutes the Big Smoke was the only one burning. They called it ''Steam Boiler.'' However, it won and thought I would inform you.

C. F. Bushnell.

The contestants were allowed to use any fuel they desired and as much or as little of it as thought advisable. The contestants were given one minute in which to light their smokers, then let set for thirty minutes. At the end of this period, the one that smoked best in thirty seconds won the prize.

Buy Woodman Section Fixer



One of our men, with the Section Fixer, puts up 500 sections with top starters, in one hour and thirty minutes, 500 sections set up with top starters in ninety minutes. This includes the labor of cutting foundation, getting sections and supers and placing the sections into the supers and carrying them away. A complete job. This is nothing unusual, but his regular speed. You can do the same if you have the push after you become accustomed to the work. There is no breakage of sections. It will pay you to secure one of these machines for this work. It is the best thing of the kind on the market.

Special Sale on Honey Packages

Friction-top Pails in the 5-pound at $7.00 per crate of 100; $13.00 for crates of 203; the 10-pound size at $11.30 for crates of 113. Special prices on 60-pound cans, one-gallon square cans, and other sizes.

A. G. WOODMAN CO., Grand Rapids, Michigan

A Superior Quality at Less Cost

SUPPLIES

A Superior Quality at Less Cost

These supplies are made by the Diamond Match Co., and are of a superior quality. Hives, Supers, etc., listed below, are in the flat, and are complete with Hoffman frames, metal rabbets, and all inside fixtures.

One-Story Dovetailed Hives

Five 8-frame	$12.00
Five 10-frame	12.80

Shallow Extracting Supers

Five 8-frame	$4.50
Five 10-frame	5.00

Full-Depth Supers

Five 8-frame	$6.00
Five 10-frame	6.80

No. 1 Style Comb Honey Supers

Five 8-frame	$4.30
Five 10-frame	4.70

Standard Hoffman Frames

100	$6.50
500	30.00

Our Incomparable Quality Foundation

Medium Brood

5 lbs.	74c per pound
25 lbs.	73c per pound
50 lbs.	72c per pound

Thin Super

5 lbs.	80c per pound
25 lbs.	79c per pound
50 lbs.	78c per pound

Light Brood

5-lb. lots	76c per pound
25-lb. lots	75c per pound
50-lb. lots	74c per pound

Aluminum Honeycombs as now made by Duffy-Diehl Co. are meeting with success. We carry these in stock to supply Eastern beekeepers.

HONEY! HONEY! HONEY!

Beekeepers who are supplying Honey to a regular family trade, or who are located along the highways, and are supplying motorists, know that their customers want a honey of a uniform color and flavor. And unless the honey is at all times uniform in color and flavor, customers sometimes become dissatisfied. Our special blend of Fancy Honeys (liquid) is always uniform and is of a fine mild flavor, and will satisfy the most exacting trade.

Special Blend of Fancy Honey (Liquid)

10-lb. Tins, 6 per case	16c lb.
5-lb. Tins, 12 per case	17c lb.
2½-lb. Tins, 24 per case	18c lb.
Pure Vermont Maple Sap Syrup, case of 12 5-lb. tins	$14.00

Various Grades, Crystallized, 60-lb. Tins

Water White Orange	14c lb.
Water White Clover or White Sage	12c lb.
Extra Light Amber Sage	11c lb.
N. Y. State Buckwheat	10c lb.

GLASS AND TIN HONEY CONTAINERS

2½-lb. Cans, 2 dozen reshipping cases, $1.45 case; crates of 100	$ 5.00
5-lb. Pails (with handles), 1 doz. reshipping cases, $1.35 per case; crates of 100	7.75
10-lb. Pails (with handles), ½ doz. reshipping cases, $1.10 case; crates of 50	5.75
60-lb. Tins, 2 per case—NEW, $1.30 case; USED	.25

White Flint Glass, With Gold Lacquered Wax Lined Caps.

8-ounce Honey Capacity, Cylinder Style,	$1.50 per carton of 3 dozen
16-ounce Honey Capacity, Table Jar Service	$1.40 per carton of 2 dozen
Quart or 3-pound Honey Capacity, Mason Style	$1.00 per carton of 1 dozen

HOFFMAN & HAUCK, INC.

WOODHAVEN, NEW YORK

What

Dadant's Foundation

Means

Based on actual tests in our own apiaries of many hundred colonies, we have always aimed to stress those qualities in DADANT'S FOUNDATION which made for a better acceptance by the bees, better drawn combs and more satisfaction for the beekeeper.

THAT IS WHY, over FORTY YEARS AGO, when we discovered the injurious effect of acids on beeswax we revolutionized our methods of manufacture. DADANT'S FOUNDATION has always meant to the beekeeper, the very best.

AND THAT IS WHY (thru constant improvement) DADANT'S FOUNDATION still **TOPS THE HEAP** for real quality.

Every effort made, every experiment tried and every new kink in manufacture added, gives to our bees and later to yours, every advantage in combs and comb building.

Thousands of satisfied users will testify as to the results.

DADANT'S FOUNDATION

Every inch, every pound, every ton equal to any sample we have ever sent out. Specify it to your dealer. If he hasn't it, write us.

DADANT & SONS
HAMILTON, ILLINOIS

Catalog and Prices on Bee Supplies, Beeswax, Wax Working into Comb Foundation and Comb Rendering for the asking.

GLEANINGS IN BEE CULTURE

NOVEMBER, 1921

Winter Protection in California.

AT a meeting of beekeepers in California a few years ago the question was asked if it would pay California beekeepers to give the bees more protection for winter than that afforded by the single-walled hive. A beekeeper in the back of the room replied laconically, "Yes, wrap them in lots of honey." In the language of the street this man "said a mouthful." One of the prevailing sins among California beekeepers as well as beekeepers elsewhere, is that of failure to have their bees well "wrapped" in honey for winter. With lower prices on honey, no doubt the bees will be better "protected" in this respect than they were when prices were high; but apparently many beekeepers have not yet learned that it pays well to leave "too much honey" in the hives for winter, especially in the South where the bees are more active at this season.

* * *

We Extend Our Good Wishes.

WE and our readers extend good wishes to Mrs. Iona Fowls Wheeler, for several years past the able and efficient associate editor of this journal. On Sept. 13 she became the life partner of another beekeeper, Mr. Clyde Wheeler of Pittsfield, Ohio, whose acquaintance she originally made in her beekeeping activities, and she will now make her new home at Oberlin, Ohio, her first consideration and care. We do not need to speak words of praise of Mrs. Wheeler. The readers of Gleanings in Bee Culture know how well she served this journal. It was three years ago this month that announcement was made in these columns of the responsible editorial duties she was to be given as associate editor, and she did not fail in them. To rare faithfulness in the performance of duty she added exceptional beekeeping knowledge and high intelligence. This made her services to this journal valuable in a marked degree, and until her asked-for leave of absence to tour the South last winter and spring she bore a large part of the editorial burden and did it always with the finest sense of service to American beekeepers.

In her new field of activity and aspiration, we (meaning readers as well as editors of Gleanings) wish her and hers all happiness and prosperity. We shall hope still to print occasional contributions from her virile pen, for she will remain a beekeeper as long as bees fly and she lives—and may she live long indeed and prosper.

* * *

The Condition of Bees for Winter.

REPORTS from most sections of the United States indicate that the bees will go into the winter unusually well supplied with young bees, and in many places they are also well supplied with stores; but in other places they are short of stores or have stores of inferior quality. The condition of the colonies as to young bees and winter stores in various parts of the country is also indicated on our market page under "Opinions of Producers" where these two items are given in per cent in separate columns. Taking the country as a whole, the bees are in better condition for winter than usual. No doubt thousands of these splendid colonies of young bees will perish this winter from starvation or in the far North because of poor stores, while other thousands will be so greatly weakened from the latter cause that they will be of no value next season.

It is not too late to feed for winter, and no colonies should be left to perish from starvation or because of poor stores. It is time for beekeepers to quit taking chances on winter losses and provide conditions that will insure safe wintering, preparing each year as for a severe winter.

* * *

Use of Drugs in Treating European Foul Brood.

ABOUT a year ago W. H. Lewis of Edmonds, British Columbia, announced that he had a new treatment for European foul brood. His plan was to shake the bees from the combs, then spray the combs with a proprietary antiseptic preparation containing sodium hypochlorite, this being supposed to reduce the amount of infection in the combs to such an extent that the bees will clean it up entirely.

This treatment was tried out this season by the inspectors of British Columbia; and W. J. Sheppard, chief inspector of apiaries of that province, reports some success with it, in an article in the September issue of the Agricultural Journal (a publication of the Department of Agriculture, Victoria, British Columbia), as well as in an article in the September issue of the Bee World, published in England. Mr. Sheppard also states that at the same time the experiments were being carried out in British Columbia, Arthur C. Miller of Providence, R. I., was testing it out in this country and that these tests were likewise successful.

Various antiseptics have been used in England for years in the treatment of brood diseases, some recommending that the combs be sprayed, some feeding the drug to the bees in syrup, and others depending on fumigation. Strange as it may seem to beekeepers in this country many beekeepers in England still practice feeding medicated syrup to their bees as a preventive measure against brood diseases. The disputes and confusion in England as to the effect of drugs on the brood diseases apparently have come about by the failure to differentiate between European foul brood and American foul brood. The cures reported in the literature by such men as Cheshire, Simmins, and Cowan from the use of drugs indicate that they were working with European foul brood, and the failures reported by others indicate that they were working with American foul brood.

In this country the use of drugs in the treatment of brood diseases was abandoned years ago; but the statement of such men as W. J. Sheppard and Arthur C. Miller as to the efficacy of sodium hypochlorite will, no doubt, create renewed interest in this subject.

There are, however, several questions which those who are well seasoned from a long experience with European foul brood will want answered before they pin much faith upon the new treatment. The behavior of the disease during treatment, as described by W. J. Sheppard, is interesting. When the combs were treated in the spring, there was considerable re-infection, but later a stronger solution was used and the disease was cleaned up. The following is given as typical of what occurred later in the season:

> "June 28th, 1921. Colony at Langley, European foul brood very bad; at least 60 per cent of brood dead. Sprayed 8 oz. of B.-K. to gallon of water, to which four teaspoonfuls of "3 in 1" oil was added.
>
> July 2nd. Colony cleaning up well; no new infection.
>
> July 14th. About 5 per cent new infection. Sprayed again, same strength as before.
>
> July 29th. 100 per cent clean. No trace of European foul brood. Full of brood from side to side and storing honey well."

This is almost exactly what might be expected in strong colonies of a resistant strain of Italians if no treatment had been given. No doubt, check colonies were used in these experiments, and probably the data from these will be published later to show just what difference there was in cleaning up between the treated and the untreated colonies. Until this is done the data on the treated colonies are of but little value. The erratic behavior of European foul brood and its tendency to disappear later in the season make it difficult to measure accurately the efficacy of any given treatment.

The solution when sprayed with a fine mist sprayer, so that it penetrated well into each cell, is reported to kill all the eggs but not the larvae, and the bees apparently are stimulated to clean the combs after they were sprayed. Both the destruction of the eggs and the stimulation to clean up would tend in the direction of a cure whether the material functions in killing the germs of the disease or not. If this treatment should prove effective in the practical control of European foul brood, it would be interesting to know to what degree the material destroys the infection and how much of the cure is effected by reducing the amount of brood and stimulating the bees to greater activity.

However effective sodium hypochlorite may prove to be after further experiment, beekeepers who have learned to control European foul brood, by fortifying their apiaries against its inroads by means of stronger colonies of a good resistant strain of Italians, will probably not often need to resort to the drug treatment; but when preventive measures fail, the drug treatment, if dependable, may be of great value.

◆

Amount of Shrinkage in Feed Given.

IN OUR "Gleaned by Asking" department in this issue, the question comes up as to the amount consumed by the bees during the process of feeding. When feeding for winter beekeepers count on a considerable shrinkage, but there is no agreement as to how much to expect. So much depends upon the time and the manner of the feeding that experimental data obtained under one set of conditions may be entirely misleading and lead to conclusions far from the truth. Some contend that there is a shrinkage of one half or more in the weight of the syrup that is fed when it is finally stored in the combs, while others contend that the shrinkage is only a small percentage when the syrup is thick so that but little if any ripening is necessary. The great difference in the amount of shrinkage with syrup of the same density depends, of course, on the degree of activity of the bees during the feeding process. This is well illustrated in the difference between stimulative feeding in the spring and feeding for winter late in the season.

About 25 years ago when most of the honey produced in this country was produced in sections, many carefully conducted experiments were carried out by different beekeepers to determine the amount of honey that reappeared in the form of comb honey, when feeding back extracted honey at the close of the honey flow to complete unfinished sections. The data from these experiments recorded in the beekeeping literature at that time indicate that favorable conditions were necessary to secure as much as two pounds of comb honey for every three pounds of extracted honey fed, there being many cases where the loss was greater and a few cases where it was less. Feeding back to have unfinished sections completed is quite a different problem from that of feeding for winter, especially when the syrup is simply stored with but little modification by the bees in empty cells and no comb-building is necessary.

When the feeding is done in the fall, after most of the brood has emerged, the bees probably store the feed in the combs with the least possible shrinkage. The colonies are then preparing for their winter quiescence and the bees are naturally inclined to be less active than earlier. The queen has quit laying, the nurse bees are no longer secreting larval food, and the habits of all the bees as to their diet have been changed to harmonize with the new condition of rest. At this time if any honey is being handled, it is moved from the more remote parts of the hive to the now vacant cells, from which brood has recently emerged, where it will be within the cluster. Honey is moved in this way apparently without excitement or undue activity.

If a heavy syrup, nearly as heavy as honey, is fed at this time it will be stored rapidly and without much loss while being handled by the bees. It will be stored in the now vacant cells from which brood has recently emerged. If the syrup is given while it is still quite warm and fed in such a manner that it is stored quickly, the excitement from feeding is soon over and the colony again becomes quiet. Under these conditions, the usual thing is to expect at least as many pounds of thick syrup being stored in the combs as there were pounds of dry sugar used in making it; but usually there is more.

While at first thought late feeding may appear objectionable it has the advantage of causing less activity on the part of the bees, which means less of aging and less waste of food. In addition to this is the great advantage of giving good feed so late in the season that it is placed where it will be used first during the winter, thus insuring good stores for the period of winter confinement regardless of the quality of the stores already in the hive.

* * *

What About the Future of Beekeeping?

BEEKEEPERS have reason for rejoicing because of the more active movement of honey this fall, for this means much more to the industry than merely disposing of the season's crop and that held over from last year. Pushing the sale of honey now means building for the future. Whether the present activity of the market will continue for long no one can tell, but the unusual effort now being made to move the honey to consumers thru every possible channel must result in a permanent gain for the industry. Apparently honey is being brought to the attention of more people this season than ever before. It is being sold direct at the roadsides, at the apiary, and by house-to-house canvassing. It is being advertised in local newspapers not only by beekeepers but also by grocers and chain stores. It is being sold by the mail-order plan, and new consumers are being hunted up in every conceivable way. Cities and even States have staged a "Honey Week" during which intensive advertising has been carried on and large quantities of honey have been sold. Large bottlers of honey are spending annually great sums of money to push the sale of honey thru the regular trade channels.

Up to the time of the passage of the Food and Drugs Act, June 30, 1906, by the Federal Government and the enactment of the various State Pure Food Laws, much of the honey produced in this country was in the form of comb honey, the production of which prevented beekeepers from greatly expanding their business. Most beekeepers of that period operated but one apiary, only a few of the most daring attempting to produce comb honey on a large scale in outapiaries on account of the swarming problems. Since the passage of the pure food laws the production of honey in this country has increased by leaps and bounds. Unfortunately no figures are available to show accurately the extent of this increase, but production had undoubtedly been increased many fold before the tremendous stimulus to greater production which was brought about by the sugar shortage incident to the war. Finally, with production at full speed, came the slump of last year.

Honey production like most other industries is now passing thru a most critical period, and the further development of the industry in the immediate future will depend largely upon the successful disposal of the stocks of honey now in the country at a fair price to the beekeeper. If this can be accomplished now while the export trade in honey is so greatly reduced and large quantities of honey are being imported, beekeepers can go ahead with more confidence in their business than ever before, for it will mean that the increased use of honey in this country has more than kept pace with the increase in production.

Beekeepers should not cease their efforts to increase the use of honey when their crop is sold. We still have a long way to go in popularizing honey as a food. Whatever gain is made in new consumers should be kept, and those who have made a lot of new customers should see that these consumers are supplied with all the honey they want thruout the year. We need to have 52 "Honey Weeks" in a year instead of but one. Let us put honey on the American tables to stay.

F. W. L. SLADEN

In our October issue brief mention was made of the untimely death of F. W. L. Sladen, Canada's Dominion Apiarist, his death being ascribed to a drowning accident and so reported to us. A close friend and associate of the dead apiarist, C. B. Gooderham, has now sent us the following brief account of the death and life work of Mr. Sladen:

On Sept. 10, F. W. L. Sladen, Canada's Dominion Apiarist, died of heart failure while bathing at Duck Island, in Lake Ontario. Mr. Sladen had been suffering from heart trouble for several years, and only three years ago was ordered by his physician to take a long rest. It appears that Mr. Sladen, who could not swim, had been in the habit of bathing in shallow water at the edge of the lake after finishing his work with the bees, and on Saturday went into the water as usual when he was suddenly stricken with heart failure. Mr. Sladen was not missed from his tent until the next morning when a search was made by Mr. Thomas, the lighthouse keeper. Mr. Sladen's clothes were found on the shore, and the body was found in the water about 70 feet from the shore.

Mr. Sladen was born in 1876 at Shooters Hill near London, England. He was educated privately and commenced beekeeping at the age of 13. He also became keenly interested in the bumblebees and solitary bees and spent nearly all of his spare time in studying them.

At sixteen he wrote "The Humble Bee, Its Life History and How to Domesticate It." He also wrote a series of articles on the wild bees for the British Bee Journal. In 1896 he visited India to study the bees of that country, especially *Apis dorsata, A. florea,* and the domesticated varieties of *A. indica.* In 1901 he visited prominent beekeepers in Canada and the United States. It was in March of that year that he discovered the function of Nassanoff's organ in the honeybee.

All this time Mr. Sladen was specializing in queen-rearing and bee-breeding, and he developed a hardy golden bee suitable for the trying English climate. The subject of queen-rearing and bee-breeding were studied thoroly, and in 1904 he published his book, "Queen-rearing in England." A second edition of this book was issued in 1913.

The Late Dominion Apiarist.

In 1912 he joined the staff of the experimental farm at Ottawa as assistant entomologist for apiculture, and in 1914 when the bee division was separated from the entomological branch he was given the position of apiarist in charge. In 1920 this position was changed to Dominion Apiarist.

Since coming to Canada Mr. Sladen has done much for the advancement of apiculture. Almost his first work in Canada was a study of the honey-producing plants from coast to coast and of the conditions under which they secrete nectar. He has also given much study to swarm control and had developed his two-queen system by which swarming is controlled and two queens are wintered over in each hive. He has also devoted considerable study to wintering problems and recently issued bulletin No. 43 on "Wintering Bees in Canada."

Queen-rearing and bee-breeding, however, have been Mr. Sladen's first consideration, and experiments have been carried on annually by him in different parts of Canada. In 1919 a mating station was established on Duck Island and isolated mating became a fact. The experiments were continued during 1920 and 1921, and a large number of queens have been reared at Ottawa and transferred to the island for mating with drones of special breeding. Excellent results have been obtained, and purely mated queens have been distributed to branch farms and beekeepers in different parts of the Dominion. It was while carrying on this work at Duck Island that Mr. Sladen met his death.

THE QUIESCENCE OF WINTER

Relation Between Quiescence and Good Wintering. How to Help Bees Remain Young

By Geo. S. Demuth

WHETHER it be in the far North where winters are long and severe, or in the sunny South where there is but little if any cold weather, the wintering of bees, in its final analysis, consists in the saving of their energy so that they may live longer than in the summer. In the North, this prolonging of the life of the bees is necessary for the existence of the colony until brood-rearing can be safely begun, while in the South it is largely a matter of the saving of stores and preventing the colonies from becoming too weak for profit.

To live long, bees must live slowly. Ideal wintering would mean the reduction of the activity of the bees to the lowest ebb thruout the winter, so that the workers which are young in the fall will still be young in the spring, aging but little as the months of activity go by. In a sense wintering may be thought of as putting the bees away in cold storage to keep them fresh until spring.

The Bees' Instinct for Thrift.

How fortunate that honeybees are willing to give up the active life of summer, cease brood-rearing, establish a new (lower) colony temperature, and remain almost motionless for days and even weeks at a time, apparently for the sole purpose of saving to the uttermost their vitality and their supply of food! If it were not for this instinct for quiescence during the long winters of the North, none of the worker bees could live from fall until spring; and, even if they could, they would, no doubt, consume in winter about all they could possibly lay up in the summer. Without this winter rest there could be no beekeeping in the North. In fact, without this strong instinct for saving, there would perhaps be no beekeeping anywhere, for otherwise there could not be any surplus honey for the beekeeper.

Great Variation in Expenditure of Energy.

The honeybee adjusts the spending of its resources according to its needs in a most remarkable manner. It spends lavishly when spending is necessary, but saves miserly at other times. Dzierzon in "Rational Beekeeping," aptly describes the great difference between the slow living of late fall and early winter and the fast living at other times as follows:

"The vital activity of the bees varies a great deal according to circumstances and the time of the year, and the quantity and quality of food necessary are dependent thereon. The quantity of honey which a bee is able to hold in its stomach, may under certain circumstances afford it ample food for more than a week; and under different circumstances may be insufficient to prevent death from starvation within 24 hours. If we compare life to a process of combustion, then a bee's life is at one time like a spark glimmering under the ashes, and at another, like a bright flame which in a few minutes consumes the combustible matter that would have fed the but glimmering fire for a much longer time."

But the remarkable thing is that the consumption of food is apparently a definite measurement of the span of the bee's life; the more food consumed the greater the activity, and the shorter its life. The great longevity of bees under favorable conditions is well illustrated in the following from an article by Doolittle, published in this journal in 1895, page 59:

"Quietness is the essential quality for safe wintering, for with it always comes the least consumption of stores, and with a minimum consumption of stores comes the least possible exhausted vitality and the greatest longevity during the spring and early summer days. Under such circumstances, I have had individual bees by the thousand in single colonies live from the first of September until July first of the following year, or a period of 10 months, this being known by a change of queens on or about the 10th of August.

This span of life of 10 months contrasts sharply with that of six or eight weeks when the bees are working hard in the fields. It is by no means every season, even in the North, that individual bees can be expected to live this long with the best of wintering, for during the majority of springs they no doubt wear themselves out by hard work long before July 1.

This same thought was expressed in a different way by E. D. Townsend in The Beekeepers Review, 1907, page 333, as follows:

"A perfectly wintered bee has just as many days' work in her April first as she had the previous fall. * * * The fact is, a bee's life is not figured by the number of days it lives, but by the amount of work or energy used are its days numbered." This, then, is what is meant by wintering. In perfect wintering the bees are able almost literally to stay the hand of time for several months, retaining the full vigor of their youth for many times the normal span of a bee's life when measured in weeks and days. For the bees, the fountain of eternal youth lies in refraining from work or play.

Greatest Degree of Quiescence in Fall.

Thruout most of the United States the wear and the tear of bee life is reduced to its lowest ebb in November and December. At this time the bees remain quiet within their hives at temperatures which at other times would cause them to fly freely, not being tempted out every time the temperature rises to the point for safe flight. At this time they are not sensitive to slight disturbances, which at other times would rouse the entire colony to activity, apparently being comfortable and content to remain almost motionless day after day unless disturbed in some way. If the same degree of quiescence could be maintained until spring, the bees would then come out as if having slept during a long night.

Apparently the same degree of quiescence is maintained as long as the temperature within the hive ranges between 57° and about 65°F., and the bees are comfortable and not disturbed, but the trouble is these conditions are seldom present thruout the winter. As the winter progresses the bees become more active and more sensitive to slight disturbances until finally brood-rearing is begun, the length of the broodless period being determined by the length of time the conditions are favorable for quiescence. Strong colonies of young bees will remain quiet and refrain from brood-rearing for four or five months in the North if well protected and supplied with good stores; but colonies made up chiefly of old bees, very weak colonies, unprotected colonies subjected to great extremes of temperatures, colonies having poor stores, or colonies that are disturbed mechanically or by feeding will become active and begin brood-rearing after only a month or two of broodlessness. The quiescence of November and December is an unstable thing that may be easily upset by any one or more of many factors which tend to upset it.

How Quiescence is Disturbed in Warm Climates.

In the South, frequent warm days tempt the bees out of their hives, and they waste themselves in fruitless searching over barren fields or perhaps in defending their hives against robbers or in taking part in robbing other colonies. In some cases, in gathering a meager supply of food late in the season, they waste away so much that early in winter the colonies are reduced to mere nuclei that must begin to rear brood soon to save the life of the colony. For this reason, colonies are often much stronger at the beginning of winter in the North than in the South.

In the tropics the bees attempt to rest during periods of dearth of nectar, but they are almost constantly disturbed by the high temperature, by robbers, and in many other ways. At its best the wintering of bees in warm climates is a wasteful process, and it is doubtful if any individual bees there ever live as long as in the cases observed by Doolittle in New York State.

Perhaps some day, beekeepers in the South will put their bees into cellars that are deep enough underground to keep them quiet and broodless until time to take them out in order that they may build up to full strength for the honey flow, instead of permitting them to waste themselves and their stores in useless activity. Already beekeepers in some of the southern States are packing their bees for winter in order to keep them quiet, pointing out the fact that it is just as important to prevent the temperature going above that required for quiescence as to prevent its falling below. In other words, if winter packing in the South will keep the temperature within the hive between 57° and about 65°F., the bees will live longer, consume less, refrain from brood-rearing longer, and of course be in better condition in the spring than if the hive temperature fluctuates above and below these limits. In the southwestern States some beekeepers report better wintering and less consumption of stores when the hives are shaded during the winter and have entrances toward the north.

Two Great Disturbing Factors in Cold Climates.

In the northern portion of the United States and in Canada, quiescence is often upset by one or both of two great disturbing agencies, viz., low temperatures and discomfort from the retention of feces, but both of these are within control of the beekeeper. The lower the outside temperature, of course the more heat must be generated to keep up the temperature within the cluster. While the bees on the outside of the cluster are apparently quiet when it is quite cold outside, the active bees at work generating heat are within the cluster hidden from view. If a comb is taken out from the middle of the cluster in zero weather, the bees on the inside of the cluster will be found quite active, ready to fly out and attempt to sting, while those on the outside are not at all alert. Heat generation to keep up the cluster temperature is not confined to the North, but to a less degree is necessary during cold weather thruout most of the United States.

Discomfort from Accumulated Feces Often Most Destructive Factor.

While in unprotected hives heat generation destroys the vitality of the bees rapidly, the activity resulting from discomfort from accumulated feces is often much more destructive. In fact, if the bees are using poor stores, a month of confinement without a cleansing flight may cause them to become so active because of the distress that the cluster is broken and the whole hive is warmed up almost to summer temperatures. When this happens the bees, of course, age very rapidly since they, no doubt, generate much more heat than would be necessary to maintain the proper cluster temperature when the temperature outside is below zero. If the bees are not relieved by a cleansing flight, this activity is constantly increased until the entire cluster becomes a seething mass that soon burns out the lives of the bees. If the bees are in this condition in a cellar the protection afforded by the cellar can no longer function, because they now generate more heat than would be necessary to keep warm if outside. If a day suitable for a cleansing flight occurs, such colonies, if outside, will relieve themselves if the bees still have sufficient strength to fly and return to the hive; but the aging resulting from such excessive activity makes them more sensitive to disturbing factors, and the same degree of quiescence is not again possible for them, which makes the next period of confinement still more destructive. If such colonies do not consume all their honey and starve in midwinter, the bees usually die off miserably early in the spring in the futile attempt to rear young to take their places.

On the other hand, when bees do not have to generate much heat, as when wintered in a good cellar or well protected outside, and at the same time have good stores, such as either well-ripened straight clover or alfalfa honey or granulated sugar syrup, the accumulation of feces is so slow that the bees remain quiet thruout the longest northern winter without a cleansing flight, being nearly as young in the spring as they were in the fall. Somewhere between these two extremes is the manner in which the vast majority of bees in the North come thru the winter.

At first thought one would expect bees to winter much better in the cellar than outside, farther south than cellar wintering is now practiced, on account of not being exposed to freezing temperatures; but, unless the stores are of the very best, bees in a good cellar often suffer greater wear and tear from restlessness than if exposed to extreme cold outside but having occasional cleansing flights. Of the two great disturbing agencies in the North, cold and accumulated feces, the latter is often much more destructive. For this reason the first consideration for successful wintering year after year in the far North is that of good stores.

Conditions for Proper Cleansing Flight Before Cellaring.

When bees are wintered in the cellar where they are confined four to five months without a cleansing flight, their condition when first put in is extremely important. Beekeepers have tried putting the bees into the cellar under various conditions all the way from the middle of October until the first of January. The poor wintering, which usually results when the bees are put in too early, was formerly attributed to the longer period of confinement, but it is now known that a few weeks or even a month, added to the time the bees are confined, makes but little if any difference if conditions are favorable for quiescence. If bees are put into the cellar too early, before they have completely changed their habits of living, reduced their diet, acquired the habit of quiescence, and finally, by a good cleansing flight, rid themselves completely of the effect of fall activities, they are not in good condition for greatest quiescence. Perhaps some of the young bees have never been outside for a cleansing flight. A few restless bees in the fall can prevent the colony from becoming quiet all winter. It is better to leave the bees outside until at least five or six weeks after the queen ceased laying and until after the bees have been confined to their hives for at least a short time, so they will feel the need of a cleansing flight. Usually in October and early in November bees will fly but little because they do not need a cleansing flight; but after they have been confined to their hive for 10 days or two weeks they will fly freely on the first suitable day, often voiding feces in greater amount at this time than after four months or more of confinement in the cellar afterwards, thus indicating the importance of leaving them outside until they rid themselves of this last vestige of their more active life of autumn.

After this cleansing flight there is no advantage in leaving them out for a later flight, for after having completely changed their mode of life they do not need further cleansing flights until spring, if the cellar conditions are favorable and the stores are good.

Bees that are put into the cellar not less than five or six weeks after the queen quit laying and immediately after a good cleansing flight following a short period of confinement, usually winter better than if put in either earlier or later. This means that where bees are now wintered in the cellar, the date for putting them in, as a rule, is some time in November, usually after the middle of the month and strangely enough often about the 20th, or just before.

The manner in which bees are handled when putting them into the cellar must make some difference in the beginning of the accumulation of feces. The less the disturbance, of course the better, but fortunately they are not so easily disturbed at this time and they soon quiet down afterwards. A cloudy day is better for putting them in than a bright day, even if the temperature is the same. If carried into the cellar and put in place carefully on a cloudy day when there is no snow and the temperature is between 35° and 40°F., the bees are disturbed but little, and if put in within a day or two after having a good cleansing flight they should be in fine condition for quiescence.

THE VALUE OF WINDBREAKS

Natural Windbreaks Best if Available. How to Build a Good Portable Windbreak

By E. R. Root

It is only within the last few years that proper emphasis has been placed on the value of windbreaks for outdoor wintering or springing. Several prominent beekeepers, among them Dr. C. C. Miller, I think, have said that, if they had to choose between windbreaks and packing, they would take the former. I personally know one or two cases where bees, in single-walled hives, well screened by windbreaks, have wintered successfully where bees in the immediate vicinity in packed hives out in the open have died. This should not be construed as an argument that packing is of no value. There are many facts to prove that, other things being equal, a well-packed colony in the spring or winter will consume less stores, winter better, and have more brood, than colonies in single-walled hives. But the ideal combination is a good windbreak and a sufficient amount of packing. Deep snows, if not dense enough to freeze up the entrance, are also very helpful. The engravings herewith submitted, in connection with the legends beneath, will show that we practice what we preach. We pack and windbreak both.

Nature will very often furnish *natural* windbreaks that are much superior to anything man can put up where there is nothing. A sidehill gradually slanting down from the north to the south, with shrubbery, fence, or trees on top, makes an ideal windbreak. Sometimes a location can be found where the hill on the windward exposure is in form of a semicircle. Cases in point are the apiaries shown in Figs. 1 and 2, these being well protected by a hill. The small

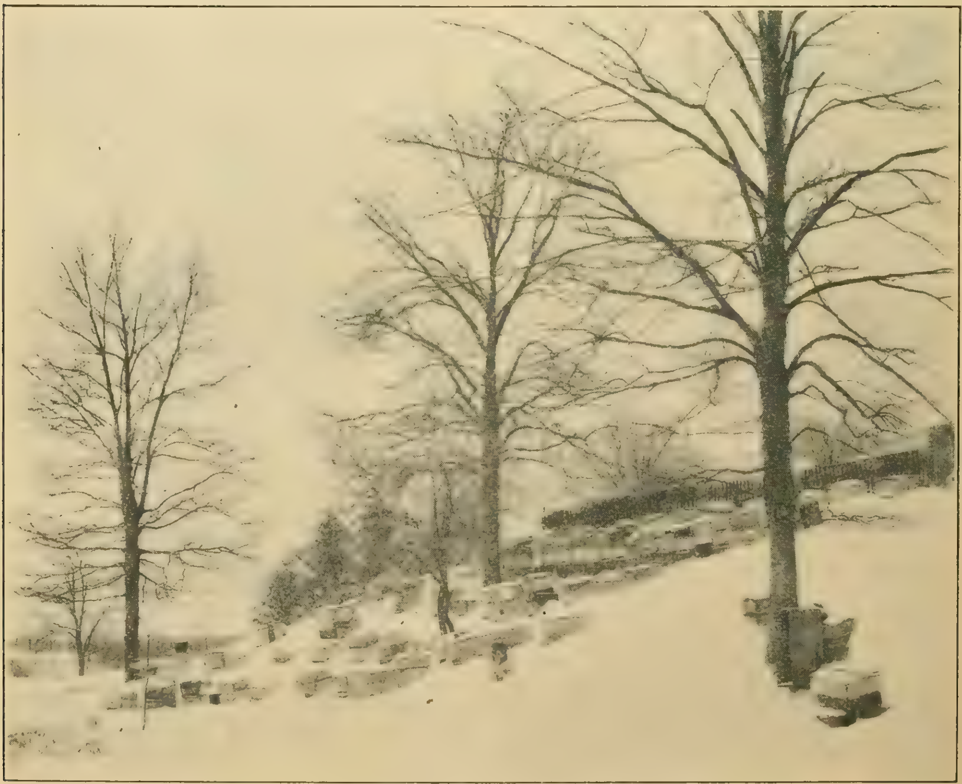


Fig. 1.—This is a natural windbreak on the lee side of a hill. Additional protection is afforded by a picket fence, some farm buildings, and a small orchard on top of the hill. It should be clearly understood that a hillside facing the south is not necessarily a good place for wintering unless some kind of obstruction is *on the top* of the hill to prevent a north wind from sweeping over the hill and down on the bees. The hillside where the bees are in this case has a southeast exposure. Over on the east side, about 300 feet away, is another hill on top of which there are some buildings and a row of evergreens. Bee have wintered well in this spot for years in what is known as the Leister yard, owned by Adam Leister, who furnishes us bees every year.

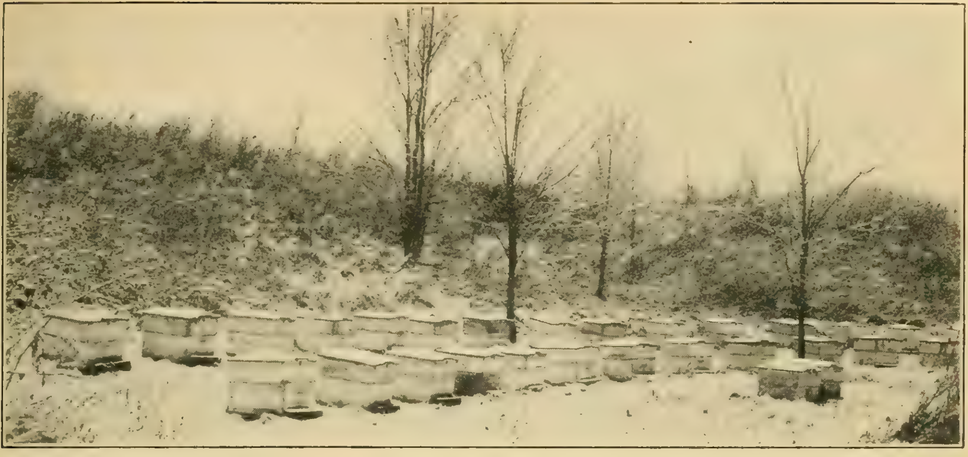


Fig. 2.—This apiary, belonging to Mr. Pritchard, is located at the bottom of a hill which forms a semicircle protecting the bees against the west, north, and east, leaving only a southeastern exposure. The thick growth of young trees on the top of the hill, together with the larger trees in the apiary inclosure, would make it impossible for any eddying currents to sweep down the hill and on the hives. The arrangement as a natural windbreak is ideal.

trees in the background and down among the hives help to break the violence of the wind. I should unhesitatingly put such a location as ideal.

A good winter location is a cleared spot near the south edge of young timber over which the bees can fly in going to the fields. When the woods are made up of old forest trees it is too much of a good thing because the bees have to fly too high to get out.

Sometimes a spot can be found on level ground where there is a dense growth of young trees on the northwest, and an exposure on the south and east. See cover picture, this issue. This is all right provided there is no windsweep from the south.

It often happens that no location can be found that provides any natural windbreaks. The only thing that can be made available at once is a high board fence. Experience in our case shows that it may be desirable to move the apiary on account of a failure of honey sources. For example, several farmers in the locality may suddenly take a notion to stop growing alsike and put in some other crop to give the soil a rest. On account of such contingencies our fences are made up of panels, each panel being

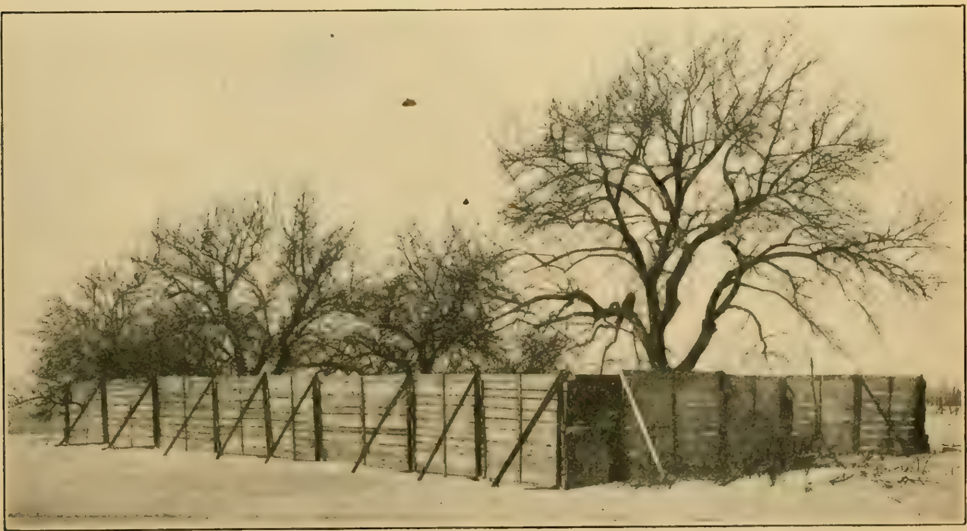


Fig. 3.—This is an artificial windbreak surrounding a Root apiary in a small orchard. But as there is a clear windsweep on level ground for over a mile in all directions this fence was put up. The location is desirable because it is in the center of an alsike-clover district.

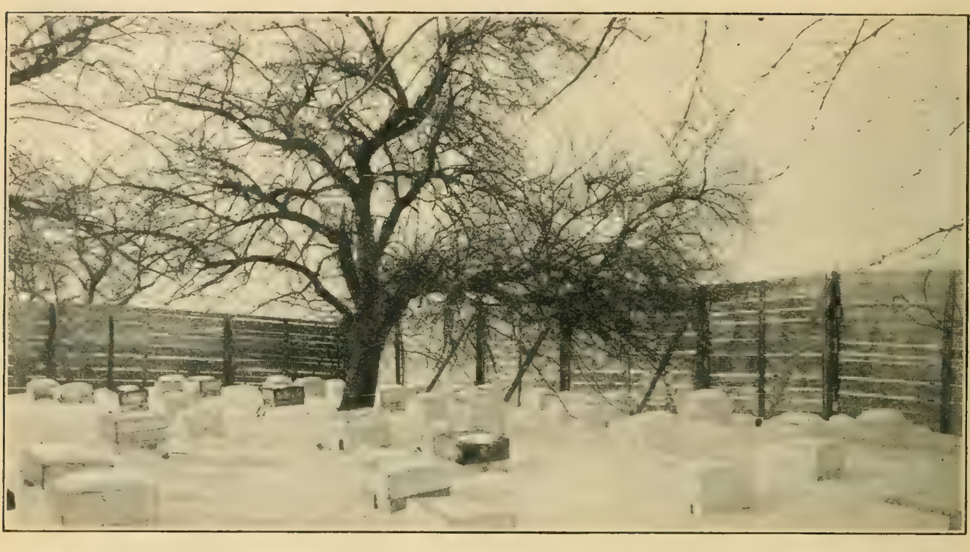


Fig. 4.—The interior of apiary shown in Fig. 3. It is always desirable to have trees inside of an inclosure like this. In the first place, they furnish shade in the summer; and in the second place they lessen the force of the air currents that strike the side of the fence. The boards are separated slightly to allow the wind to filter thru very slowly, thus preventing a blast from glancing upward and then downward.

held in place by means of braces reaching to the ground on both sides, the bottom end of the braces being nailed to a stake. (See Fig. 5.) This construction not only enables us to "pull up stakes" literally but to move the whole apiary, windbreaks and all, at comparatively little expense. The panels of fence after being taken down can be laid on a big truck and carried to the other location. But even if there were no intention of moving, this construction is cheaper than fence posts that must be long enough to reach to the top of the fence and into the ground at least 2½ feet. They must be strong enough to withstand the heavy pressure of wind. Fence posts meeting these requirements are rather expensive; and a simple brace made up of two ⅞-inch boards nailed together is a great deal cheaper, with, of course, the great advantage that the whole outfit can be moved to another yard if necessary. Fig. 3 shows one of our apiaries as it looks from the outside, and Fig. 4 an inside view of the same apiary.

It will be noted in the artificial windbreak that the boards are placed a slight distance apart. As a little of the blast of air filters between the boards it stops it from rushing upward so fast, and then diving downward as it will do with a solid construction.

There are locations where bees have been successfully wintered with comparatively little loss for years, without any windbreaks. Deep snows or some general contour of the country might protect bees in such a place without a windbreak; but to argue that bees do not need windbreaks is like saying that whisky is conducive to longevity because one or two men have lived to a ripe old age and drank it all their lives.

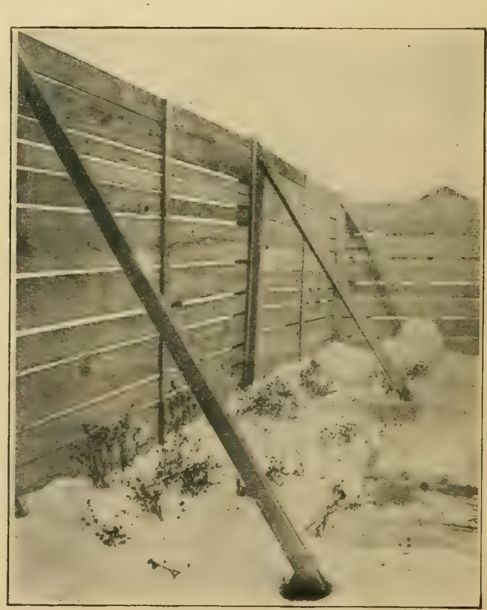


Fig. 5.—Showing details of construction of an artificial windbreak. It will be seen that the windbreak is made up of panels, the boards of which are placed about an inch apart, each panel being held in place by means of braces on the outside and inside. The arrangement makes it possible to move the windbreak as well as the apiary itself. The panel is separated, the braces loosened, when the whole is laid on a truck.

BEST QUEEN CAGE CANDY

Historical Review of Processes Used. Important Discovery by Bureau of Entomology of Cause of Failures

By E. F. Phillips and Jay M. Smith

FOR many years it has been the practice of beekeepers to ship queens by mail, using a soft candy for the nourishment of the queen and her attendants on the journey. Such a candy was probably first made by a German beekeeper named Scholz for feeding bees, and his name is usually given to this candy by European writers. In the United States this candy is usually called "Good candy," named for I. R. Good, Nappanee, Ind., who was the first to make this generally known to American beekeepers, altho, before it was described by Good, the recipe for making it had been published in an American bee book (Langstroth, ed. 1870).

On May 3, 1912, the postal regulations concerning the mailing of queen bees were amended to admit "Queen bees and their attendant bees, when accompanied by a certificate of the current year from a State or Government apiary inspector to the effect that the apiary from which said queen bees are shipped is free from disease, or by a copy of a statement by the beekeeper made before a notary public or other officer having a seal that the honey used in making the candy used in the queen mailing cage has been diluted and boiled in a closed vessel." Since in several of the States from which queen bees are shipped in large numbers there has been no provision for apiary inspection, many queen-breeders found it necessary to make the candy of boiled honey, and others who had their apiaries inspected used such candy as an additional precaution. The regulation created some new problems for the queen-breeder, who was confronted by the necessity of making a new kind of candy. On June 18, 1918, the postal regulations were again amended to permit the mailing of bees without combs under the same limitations.

It has been the experience of many queen-breeders that candy made of boiled honey is unsuited for the shipping of queen bees, perhaps because of the destruction of part of the sugars by the prolonged heating. To overcome this difficulty and at the same time to conform with the spirit, if not the letter, of the regulation, the use of commercial invert sugar, made from cane sugar, has become quite common. This is quite like honey chemically, but is, of course, not identical. When this is used, many queen-breeders complain that the candy gets too hard, resulting in the death of the bees and queen if the journey is long.

Review of Past Methods Employed.

Before discussing experiments recently made on this subject, it seems desirable to review the experience of various queen-breeders in the past; and, as the exact methods by which these men made their candy are important, it will be well to quote their exact words in several cases to avoid misunderstanding. This will prevent a repetition of mistakes.

The first description of soft candy for bees that has been found is that in the third edition of Langstroth's "Hive and Honey-bee" (1870). He says: "The Rev. Mr. Sholz [Scholz], of Silesia, recommends the following as a substitute for sugar candy in feeding bees: Take one pint of honey, and four pounds of pounded lump-sugar; heat the honey, without adding water, and mix it with the sugar, working it together to a stiff doughy mass." The honey was heated in this case and the ratio of honey to sugar was 3:8. We have not located the original description of Scholz candy.

We have not been able to locate Good's first description of his candy, so that the exact time of his discovery is in doubt; but in 1881 he said: "I use granulated sugar, with honey enough added to make it stick together." (Gleanings in Bee Culture, IX, p. 374). The exact ratio is not stated and nothing is said about heating the honey. At this time there was considerable discussion regarding the making of this candy, especially if the queens were to be shipped long distances, and in 1882 Good wrote: "If you wish to send queens long distances without loss, use granulated sugar, with honey stirred in for feed. * * * You can send queens safely to California without water with this kind of feed." (Gleanings in Bee Culture, X, p. 562). So far as we have been able to learn, Good always advocated the use of granulated sugar rather than pulverized sugar as was commonly advised at that time and as is now used.

The first marked success in mailing queens across the Atlantic Ocean was that of Benton, then located in Munich, Germany, and the bee journals of the period contain frequent articles by him or by those to whom he had successfully mailed queens. In 1884 he wrote Good regarding his success, and this letter was quoted by Good in an article in Gleanings in Bee Culture (XII, pp. 728-729). The following is taken from the Benton letter: "I have not, however, made the candy just as you made it first, but have employed pounded sugar in mixing it. I have even taken sugar as fine as wheat flour." He further states that the candy on which he succeeded in mailing the first queens to America has been abandoned in favor of the Good candy. In commenting on the merits of the candy used by Benton, the editor, A. I. Root, states that it is probably due to the fact that the sugar had been pounded fine. Nothing is said of the proportions of honey and sugar used, and it would seem that the honey was not heated.

In Gleanings in Bee Culture for 1882 (X, pp. 478-479), Doolittle stated that he was using Viallon candy (made of white and brown sugar and wheat flour); but in the fall of 1882 he abandoned this candy (American Bee Journal, XX, p. 533), and in 1883 (American Bee Journal, XIX, p. 511) he described his method for making Good candy, which he then used, as follows: ''Take about two pounds of pulverized sugar, which can be obtained from any grocery store, and put it into an ordinary tin pan; make a little hollow in the sugar and put therein 3 tablespoons of good clover or basswood honey. Now mix with the spoon till it gets quite thick, when the spoon is laid aside and the batter is kneaded, as a woman would knead dough for bread. This kneading is kept up till you can roll the candy in your hands, as boys roll snowballs. When it is so hard that it will retain its round shape on a flat surface, except to flatten somewhat on the underside, it is ready for use.'' Nothing is said in these directions about heating the honey, and the exact proportions of honey and sugar are not given. In an article in 1884 (Gleanings in Bee Culture, XII, pp. 797-798), Doolittle stated that he did not think that the sugar in the Good candy was of any value as food for the bees, but served only to hold up the honey, and he repeated this statement in several later articles. There is every reason to believe this an incorrect conclusion.

Application of Heat When Mixing.

In his book, ''Scientific Queen-rearing as Practically Applied'' (1889), Doolittle modified the directions for making the queen-cage candy as follows: ''This is done by taking a quantity of powdered sugar, and putting it in any dish; * * * [preferably one of agate ware] * * * having the sugar in the dish, set the same on the stove or over a lamp, and put some nice, thick honey to heat also (such honey as will not granulate easily being preferred, for spring and fall use), letting both heat slowly till of about the warmth that you can conveniently hold your hand in. * * * To get the sugar evenly warmed thru, it may be necessary to stir it occasionally.'' The remainder of the directions were not different from those given earlier. Ten years later (Gleanings in Bee Culture, 1899, XXVII, pp. 268-269), Doolittle repeated these directions, so he must have used this recipe successfully for some time. The only change to be noted in the later directions is that he left the sugar ''near the stove'' for four to six hours, and that for the shipment of queens to warm climates he kneaded in one-sixth of the bulk of the candy of fine granulated sugar. In the 1891 edition of the A B C of Bee Culture, A. I. Root quoted from J. D. Fooshe as follows: ''Take good thick honey and heat (not boil) it until it becomes very thin, and then stir in pulverized sugar.''

Apparently the next change made in the recipe for queen-cage candy was that described in 1893 by Mrs. Jennie Atchley (Gleanings in Bee Culture, XXI, p. 881). The directions are: ''We use nothing except the finest of confectioners' sugar, and thoroly pulverize all lumps, and use honey that has been boiled or brought to the boiling point.'' In a later article (Gleanings in Bee Culture, XXII, p. 379), she states: ''I gently boil and skim, or use honey from a solar wax-extractor, as this honey is not so apt to candy.''

In 1906, E. R. Root in an editorial in Gleanings in Bee Culture (XXXIV, p. 1050), stated: ''In selecting an extracted honey for use for making a queen-cage candy, it is *very* important that the source of that honey be known. If unknown it should be thoroly boiled to disinfect it from any *possible* germs of black or foul brood. One boiling may not be sufficient. Boil it one hour and let it stand two or three days, and then boil again another hour. This is better than boiling three hours, all at one time.'' This author has in mind fractional sterilization, which is, of course, useless since the bacteria to be killed do not germinate in honey. This is the first reference that we have been able to find of boiling honey for the purpose of destroying the organisms causing a brood disease.

The warming of the sugar and honey, as described by Doolittle, was doubtless for the purpose of facilitating the mixing; and the boiling as described by Mrs. Atchley was to prevent granulation of the honey, altho just what difference this can make in the queen-cage candy is not at all clear. In fact, two years ago before in the 1891 edition of A B C of Bee Culture, A. I. Root stated: ''Sage honey, for some reason or other, has the property of rendering the candy in time as hard as a brick, and, of course, should not be used.'' Sage honey granulates less quickly than any other American honey and often remains liquid for years. The present authors have not confirmed these statements about sage honey. Following the directions of Fooshe, Doolittle, and Mrs. Atchley, and the warning of E. R. Root, there seems to have been an increasing tendency for those making candy of this type either to heat or to boil the honey, and in some cases the sugar was also warmed.

When the new postal regulation went into effect in 1912, it was rather natural, therefore, that many queen-breeders mixed the sugar and honey, while the honey was still quite hot. In spite of this tendency, there were frequent warnings against the practice in the form of directions for making the candy of cold honey. In 1894 E. R. Root (Gleanings in Bee Culture, XXII, p. 662) quotes from a letter from Ph. J. Baldensperger, Nice, France, as follows: "I took common beet sugar; pounded it as fine as possible, then dropped in cold extracted honey till the dough was so firm it would hardly flatten down when made into a ball." Baldensperger was a former pupil of Benton and probably learned to make the candy under his direction. In 1917 Grant Anderson (American Bee Journal, LVII, p. 130) gives the following directions: "This must be made of the best powdered sugar and well-ripened honey of good quality. Make a stiff dough of the candy and let it set several hours and then work it over again. * * * Never heat the candy in making." In 1915 one of the present authors (Beekeeping, p. 426) gave the following direction: "A soft paste or candy made by kneading together confectioners' (not powdered) sugar and honey without heating."

Use of Glycerine and Glucose.

We may omit from the present discussion the various soft candies that have been recommended for different purposes into which other ingredients were placed. It should be stated, however, that, some years before, A. E. Manum had added a small amount of glycerine to keep the candy soft (E. R. Root, Gleanings in Bee Culture, 1890, XVIII, pp. 847,849); and in 1893 E. R. Root stated in Gleanings in Bee Culture (XXI, pp. 759-760) that he had experimented with glycerine. In 1912, after the new postal regulation went into effect, Tyrrell (Beekeepers' Review, XXV, p. 261), quoted a queen-breeder to the effect that he was using glycerine to keep his candy soft. Several attempts have been made to make a candy containing commercial glucose for use in feeding bees in winter as well as for mailing cages; but, as glucose is so disastrous to bees in confinement, we need not go into details regarding this type of candy. In searching for facts regarding the past history of candy for queen-cages, the authors have found 71 articles dealing with the subject, and have passed by many notes of no importance. In the summary so far given no attempt has been made to include even all the better articles, but rather to show the trend of the time.

Recent Experiments by Bureau of Entomology.

During the past year or two complaints from queen-breeders regarding candy made of boiled honey have been unusually frequent, and more recently they have complained of their inability to make a good candy of invert sugar. Because of the importance of the queen trade it seemed well worth while to make some study of the problem, and this was done in co-operation with the Carbohydrate Laboratory of the Bureau of Chemistry, Jay M. Smith being the chemist engaged in the work. The first task seemed to be to make candies of many sorts, just such as had probably been made by queen-breeders, to see how quickly they became too dry for use. The honeys used were clover, alfalfa, sage, and a mixture chiefly from tulip tree. Sage honey is one which does not granulate, and alfalfa is perhaps the most quickly granulating honey found in large quantity on the market. Candies were made of both boiled and unboiled honeys, of invert sugar, and of boiled honey to which invert sugar had been added to increase the proportion of levulose. It was assumed that, since levulose is hygroscopic, it is the agency by means of which the candy is kept soft, and from this it might be inferred that sage honey would make a better candy than alfalfa honey. At that time the statement of A. I. Root to the effect that sage honey does not make a good candy was unknown to the author, and it was found that when the sage honey was boiled it became more discolored than did the other honeys. In boiling the honeys they were found to boil at a temperature of about 248°F.

After work had been begun on this subject a visit was made to one of the most extensive queen-rearing establishments in the country to observe how the candy was actually made with which such poor results were obtained, it having been impossible to arrive at a correct understanding of these difficulties by correspondence. The candy was there made with commercial invert sugar. This was first heated to 176°F., at which point powdered sugar was introduced, all at one time, in the proportion of one part of invert sugar to slightly less than two parts of powdered sugar. The introduction of the mass of powdered sugar lowered the temperature, but it was then kept over the water bath (205°F.) and stirred vigorously for 40 minutes, in order to produce a thoro mixing of the two sugars and to separate the remaining crystals of powdered sugar completely and to coat each one with a film of liquid invert sugar. At the end of the 40-minute period the liquid had reached a temperature of 191°F.; it was then poured out to cool, but in most cases it had been found that the resulting candy was either too soft or too hard.

Why Heating Caused Frequent Failures.

On returning to Washington a small amount of candy was made by the same process and in similar proportions, with the modification that the powdered sugar was introduced slowly; and in this case it was found that, at the end of 40 minutes' stirring, the whole amount of powdered sugar had been melted (which had not been the case when the larger quantity was made), then on cooling the mass was a hard clear candy. The same was true when even a larger proportion of powdered sugar was used. It is, therefore, evident that the trouble with this recipe arises from the fact that a variable amount of powdered sugar is melted, and, on cooling, it either approaches a hard clear candy on the one hand or a fondant that is entirely too soft for use in queen-mailing cages on the other. It is clear from this experience that the cooking of the candy during the process of making introduces variations which made the method wholly unreliable.

In the first series of experiments undertaken the honeys were sterilized under pressure of 15 pounds at a temperature of 250°F. for 30 minutes. A second lot of the same honeys was sterilized by boiling in the open air at 250°F. for 30 minutes, and still a third lot of the same honeys was diluted with an equal quantity of water and evaporated by boiling until the temperature reached 250°F. It was found that during the process of sterilization under pressure there was a loss in the amount of levulose in the alfalfa and white clover honeys, which, however, did not show any serious decomposition, as evidenced by discoloration. In the case of the sage honey, however, there was a loss of 7.5% of the levulose content and the sage honey became quite discolored. When the honeys were sterilized in the open the loss in levulose for each one amounted to 7.5%, showing that the effect of heating in the open tends more toward the destruction of levulose than when the heat is applied under pressure. Candies were made of all these honeys and whenever the mixing was done with both the sugar and the honey at room temperature the candies stayed soft.

The reason for determining the loss of levulose, which is a very unstable sugar when heated at such a high temperature and in the presence of a slight percentage of acidity which is present in honey, was due to the fact that levulose has the property of absorbing moisture from the air, and it was assumed that this was perhaps the reason why candies made of boiled honeys often do not remain soft.

Having determined that the levulose in boiled honeys is partly decomposed, it was thought advisable to try adding some levulose to replace that which had been destroyed. A candy was then made of 19 parts powdered sugar, 5 parts of boiled honey, and 2 parts of invert sugar. When this was mixed in the usual way, the resulting candy was satisfactory. The mixing was done while all the ingredients were at room temperature.

Other candies were made by using a small amount of glycerine, which has even greater ability to retain its moisture than has levulose. As has been stated earlier, this method had previously been used by some queen-breeders. Due to the low density of the glycerine, more sugar can be mixed in than when invert sugar or boiled honey is used, and 6 parts of boiled honey, 1 part of glycerine, and 22 parts of powdered sugar were used with success. However, unless there is no other way to obtain a satisfactory candy, glycerine will not be used for this purpose. The effect of glycerine on bees has not been determined.

Various Candies Given Severe Test.

In order to give the various candies made in these experiments as wide a range of conditions as possible, some samples were kept in the laboratory at ordinary room temperature and humidity conditions, and another lot was kept in an air-tight cabinet where these conditions could be controlled. The air was kept dry in this cabinet by means of sulphuric acid as an absorbing medium, and the relative humidity was reduced to 20%, which is as severe a test as any candy in a shipping cage would encounter for any considerable time. The temperature of the cabinet was maintained at about 80°F. by means of a carbon electric lamp. Under these conditions, which represent an exceedingly dry climate with a moderately high temperature, the candies made by the formulae that proved the most useful remained soft for three or four weeks, at the end of which time they were removed.

At the beginning of the series of tests, it had not come to our attention that so many queen-breeders were mixing their candies under heat; and, as a result, all the candies were made by first sterilizing the honeys, then allowing them to cool, and then mixing the candies at room temperature. It was found that practically all of the candies so made remained soft enough for use as long as the tests were continued. Later, when we had consulted the literature more thoroly tests were made by mixing the sterilized honey with sugar at higher temperatures, and the unsatisfactory results of this method have already been explained.

Honey at 140° or Lower for Mixing.

The conclusion to be drawn as to ingredients which can be used is that boiled honey, commercial invert sugar, boiled honey and invert sugar mixed, or sterilized honey and glycerine can all be used for the making of a satisfactory candy, so far as the softness of the product is concerned. As for the temperature at which the mixing should be done, the conclusion is clear that practically all the trouble which the queen-breeders have encountered has arisen from mixing while the honey or invert sugar is too hot, or in maintaining a high temperature during the mixing process. No harmful results seem to follow from heating the honey to about 140°F., just before mixing with cold powdered sugar.

In conclusion, the proper way to make a soft candy for queen-cages is to pour a good quality of sterilized honey, or commercial invert sugar, into a quantity of finely powdered sugar, while both are at ordinary room temperature. Stir the honey or invert sugar into the powdered sugar until it is no longer possible to stir with a spoon or stick. Then remove the mixture to a mixing board, such as the housewife uses in making bread, and knead the mass thoroly, adding more powdered sugar as it can be taken up. The proper density of the candy is reached when the ball stands up with very little flattening at the bottom. The usual proportions will be one part of honey to two and one-half parts of powdered sugar. It usually happens that after a few hours or a day or two the candy becomes softer, in which event more powdered sugar must be kneaded into it. The secret of the failures of the past seems to lie in the application of heat during the making.

Boiled Honey Objectionable.

Since boiled honey is not especially desirable as a food for bees during a period of confinement, probably due to the products of decomposition contained therein, it is perhaps safest for the queen-breeder to use only commercial invert sugar in the making of his soft candy. It will in some cases be found that this softens with standing more than does the candy made with honey, and if this occurs more powdered sugar should be added. In case commercial invert sugar is used, it must be an invert sugar which is made by the inversion of cane sugar. Queen-breeders whose apiaries are found free of disease by state inspectors will get the best results by using unboiled honey. A soft candy, made by the methods described, can be used as a delicious confection by adding nuts.

WINTERING IN CELLARS

Ten Pounds of Sugar Syrup Fed Late Has Given Best Results in this Beekeeper's Experience

By Geo. B. Howe

WHEN bees are wintered in the cellar they must be prepared beforehand the same as for outdoor wintering, by seeing to it that every colony has a queen not over two years old. Young queens are better, but not always necessary. Old queens are unreliable.

Stores and plenty of them we must have. Altho I fought against sugar-feeding for years because it led people to believe that honey was adulterated, I wish every beekeeper would feed every colony ten pounds of cane sugar syrup as late as this can safely be done before putting the bees into the cellar. I have always had the best results by feeding two parts of sugar to one part of water. Have the water hot, then stir in the sugar, stirring until the mixture is clear, to be sure the sugar is thoroly dissolved. I add 20 to 25 pounds of extracted honey to every 100 pounds of sugar, but if there is danger of disease don't use honey, just sugar. I've tried putting in acid but could sees no difference in the stores.

I think that early-cellared bees winter better than when put in late. Here they should be put into the cellars Nov. 10 to 17 as a rule. We always get better results by cellaring at this time than to wait until December. We do not put the bees nearer the cellar floor than 6 inches if we can help it. We leave the ⅞-inch entrance open unless the cellar is so we cannot keep the mice and rats out. Then we put on coarse wire guards having not less than ¼-inch mesh. But the mice and rats in cellars annoy the bees anyway, so the cellars should be built mouse and rat proof.

I slide the cover on strong or normal colonies one eighth of an inch ahead for ventilation. I think that this ventilating of hives is the best way to keep the bees dry and healthy. Even in damp cellars it keeps them dry and clean. Without this ventilation they would be almost ruined with mould. If the cover is slid forward even ½ inch it does no harm except that the bees can get out, and it makes it bad when we put them out of the cellar in the spring as they will cluster out on the back of the hive. I put the bees out in the spring as soon as they can have a good cleansing flight, and since they are healthy they do not dwindle like poorly wintered bees do.

The cellar should be ventilated so that the air is pure. More bees are ruined by not getting fresh air than by cold. They may seemingly winter perfectly, but bees that dwindle in the spring have not wintered well, and will not build up as they should. I pile the hives in tiers as high as six in a tier, but I prefer them not higher than four or five. I have piled them in very close and had good wintering, but there should be ample room if possible.

Let those who prefer to winter bees outside do so, but after 35 or 36 years' experience in cellar wintering, I can see no reason for changing.

Sackets Harbor, N. Y.

[If the combs become wet and mouldy when the covers are sealed on tight, this can be remedied by raising the cellar temperature a few degrees so that the walls of the hive and the combs outside the cluster are not cold enough to condense the moisture given off by the bees before it can escape from the hive thru the entrance. A higher cellar temperature, if not too high, also reduces the activity of the bees especially during the early part of winter, which results in less moisture being given off. As a rule the bees will remain quiet at a higher temperature early in the winter than during the latter part of confinement.—Editor.]

FROM THE FIELD OF EXPERIENCE

NOVEL WAY TO SELL HONEY

How a Motor Cycle Can be Used to Sell Honey in Small Towns

I use a motorcycle with side-car outfit, the body being removed and a platform five feet long placed on the springs of the side car. In front I place a box that will hold about 50 bottles, pint size, with a sign, "Honey for Sale." Then I place five supers of honey on the rest of the platform. I have a common five-gallon can cut open on the side, with a rack in the bottom having a wire screen over it. I cut the honey in chunks to fill up this can to sell from. I cover the whole up with wet sacks so that bees will not rob, and over the top of all I place a canvas or gum cover to keep dust off while on the road.

I then go to a small village, open the muffler for a minute in the center of town, display the sign and some bottles, and begin to cut off little pieces of honey to give to the street children. I offer honey for sale from 2 cents' worth to a whole frame. As soon as I get a crowd I show full fine capped combs, and often sell a whole load in a Cuban town in an hour. I have some sheets of paper ready to put a pound or half pound on as they buy.

After doing this in a town a few times, the street peddlers will buy the honey as soon as I get in town at 5c per pound less than the retail price. It is wonderful the amount of honey the public will take in this way. The expense is as low as it is possible to get it, and the trouble also.

Herradura, Cuba. M. C. Engle.

AN EASY WAY TO PACK

The Quad Hive Permanently Packed on Two Sides and Crowded Together for Winter

In this system, we use four ordinary single-walled hives. The front and one side of each hive are first covered with heavy insulating paper, such as is used in cold-storage plants. Ordinary waterproof paper will answer if the heaviest obtainable is used. The heavier the paper, the better the insulation. We then nail on a block ⅞ inch thick by 2 inches wide in which a ⅜ x ⅜-inch groove is cut ¼ inch from the outer edge, to receive the outer shell of ⅜-inch lumber. This ⅞ x 2-inch piece extends from just under the water table, which covers the packing, to the bottom of the hive. Before shoving the outer ⅜-inch wall into the groove, we cover the inside of this board with waterproof paper.

The hive is then packed between the walls with regranulated cork, a dark, almost black product nearly as fine as flour and in no way to be compared with "cork chips," which are simply raw cork untreated to remove the volatile substances that hinder insulation.

We allow one inch between walls for packing, which is quite sufficient for southern Ontario where the thermometer seldom reaches zero. If we had a higher altitude or were further north, we should want more space between the walls; and if we could not get regranulated cork, we would double our packing space.

The water table covering the top of the packing is made of ⅜-inch stuff, wide enough to extend over the outer wall to give a hand grip when lifting the hive. We place the top edge of this water table ⅜ inch below the top edge of the brood-chamber and run putty ⅜ x ⅜ inch to top edge of brood-chamber as if glazing sash. Ordinary glaziers' putty will last several years, but the black sort used by boat-builders is much more durable. When the "quad" is in position, a double wall is formed clear around the outside, and the natural heat of the colonies will keep the single walls of each hive from the effect of frost.

When preparing the bees for winter we lift the hives off their stands and place the stands close against each other. We then lay a 1 x 6-inch board across the front ends of the stands, and a similar board half way between, covering the back ends of the four stands. We then set the hives on the stand, placing them close together, put the supers on the brood-chambers, and drop a piece of waterproof paper between the hives reaching from the top of the supers to the bottom of the brood-chamber, across the width of the cluster of hives, and another cut half the width to meet it the other way. We then pass a soft wire around the hives, and another around the supers, and draw the hives and supers tightly against the paper between them, by twisting the wire with a stick. By looking at the photo the paper may be seen extending about 2 inches beyond the outer walls. We crowd a piece of wood ½ x 1½ inches under the wire, double the paper over the joint where the hives come together, and put this strip of 1½-inch stuff on the paper over the crack. The hives are drawn so tightly together that cold air never reaches the single-walled part of the hives. We do not know that this extra protection at the outside joint is necessary; but it may be of some value, and is very little trouble.

The ordinary bottom-board used on a single-walled hive will be noticed at the bot-

FROM THE FIELD OF EXPERIENCE

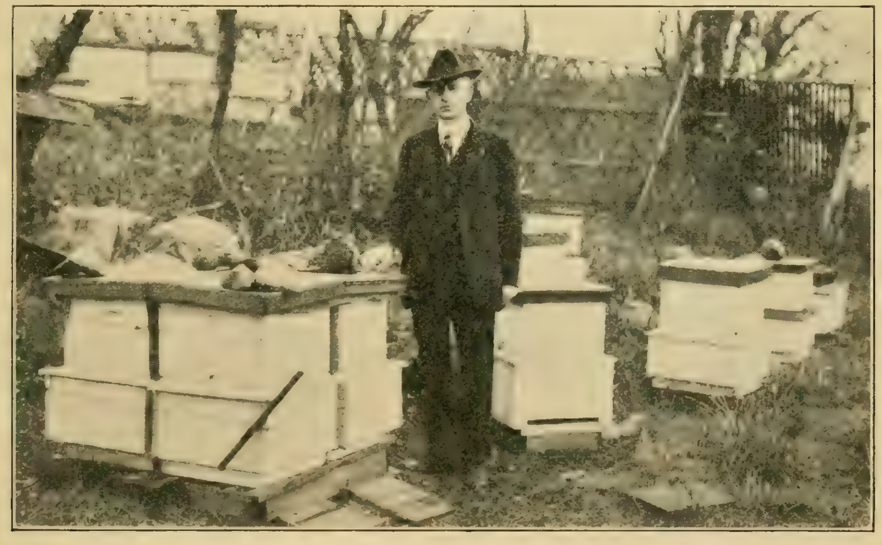
tom of the brood-chambers, the fronts and side of the hive projecting over them. The entrances are thus protected from being blocked with snow or sleet in winter, and water running down the front of the hive never touches the entrance.

We prefer not to have our bottom-boards project beyond the front of the hive; in fact, they should be enough shorter so that the front edge is one inch or more back from the front of the hive. This is a great advantage when moving bees. A board of ⅜-inch stuff cleated at the ends is placed against the front of each hive and reaches to the ground for an alighting-board. They will be seen in the illustration lying on the grass in front of the hives, as they had not been gathered up for winter when the photo was taken.

When packing the supers over the brood-chambers for winter we first place on the brood-frames a ''hill device,'' which we make of barrel hoops cut one inch less than the inside width of the hive. On top of this we place a piece of heavy burlap. We then fill the super with any good insulating material, such as regranulated cork, old forest leaves broken up fine, finely cut straw, ordinary forest leaves, cork chips, fine chaff, or sawdust and planer shavings mixed. We give these in the order that 35 years' experience has led us to believe is their relative value. We leave about 1½-inch space between the top of the packing and the honey-boards, which we use on top of the supers. A piece of waterproof paper is laid on top of the honey-boards, and on that the regular hive covers. They are too large to telescope over the supers when crowded together, but any water that gets in where the covers touch each other will be caught by the waterproof paper under the covers. The lattice fence shown at rear is made of ⅜ x 2-inch strips, spaced one inch apart and nailed diagonally to 1 x 4 stringers. Over this lattice work and running at an angle of 45 degrees are nailed ⅜ x 2-inch strips spaced 5 inches apart. This fence inclosing the apiary is eight feet high. It is much more effective as a windbreak than a tight board fence, as the open spaces in the fence break the wind up, instead of dipping down in the center of the yard.

The most that can be said against the ''quad'' plan is that the hives permanently pack on but one side and one end must be mated right and left. That never bothers the man who keeps hives in clusters of four. Our plan is to leave the hives in the position shown until the clover harvest. At the advent of fruit bloom we take the packing out of the supers and fill them with drawn combs, which usually get pretty well filled with brood. When clover opens up we spread the hives apart, put the queen below, put on the queen-excluders, then a super of extracting combs and the super of brood on top. In ten days we cut out the queen-cells and nine times out of ten we get no swarms from those colonies. Keeping the bees well supplied with empty supers also helps in getting this result.

The other picture shows the quartette in action. In the summer of 1920 American foul brood appeared in five colonies in this apiary. They were taken to our ''hospital,''



The quad hive ready for winter.

put on full sheets of foundation, and four of them now form the quartette shown in the photo. The tall hive has 13 shallow supers and one full-depth that we placed on during fruit bloom, with full sheets of foundation and no queen-excluder. At the advent of clover bloom we put the queen below, then placed the excluder on the brood-chamber, and tiered up the supers as needed. Three of the shallow supers had foundation which was all drawn out and filled excepting one super. The rest of the supers had drawn combs and were all filled with alsike honey. The hive at the left has had part of the crop taken off, and the one just behind it had a recurrence of American foul brood. It was healed this spring and run for comb honey. The latticed building is the "lookout." It is shaded by wild plums and the furniture consists of a chair, writing table, and folding couch. J. F. Dunn.

The quartette of hives in summer action, showing that the quad packing does "get by."

Ridgeway, Ont., Canada.

[No doubt, crowding four hives together would result in better wintering even if they are not packed on the exposed sides, but this arrangement affords some protection on the exposed sides as well as top protection. The weakest place as to protection is at the upper edge of the brood-chamber where considerable heat can escape unless the cracks between the supers and the brood-chambers are tightly sealed with propolis. Evidently this weak spot did not harm the colonies last winter, judging from the pile of supers on the hive when the photo was taken.—Editor.]

A BUMBLEBEE GUEST

Strange Toleration of a Foreign Species Within the Hive

Last autumn, about the end of September and early in the forenoon, when I was looking for queens preparatory to Italianizing, I was decidedly surprised to find a bumblebee cosily nestling among the other bees. He was in the thick of the cluster, about the middle of a frame. I say *he*, because when I sent it to the Bureau of Entomology at Washington, D. C., Dr. Howard informed me that S. A. Rohwer had pronounced it a male of *Bombus impatiens*—a common underground builder.

My first interest was in the bumblebee, for as long as I thought it a female, it suggested a possible way in which parasitism might arise—thru a hibernating insect seeking the warmth of the honeybee hive. Soon, however, my interest was transferred to the honeybees and their instincts. Why did they tolerate this intruder? If they thought him a drone of their own species, why did they not oust him? During the next few days I "sieved" every one of my colonies and caught all queens and during this process saw not one drone. Their own drones had, therefore, been done away with and there was no honey flow on to make them change their policy.

If, on the other hand, they recognized him as of a foreign species, why did they not expel him? Possibly they have no instinct to meet such rare cases. Do we know of any case of bees driving out or injuring any adult insect except a robber, a strange queen (the latter by balling), or drones in their cells? These, of course, are special cases of peculiar and frequent importance, where a definite instinct is to be expected. But they allow the death's-head moth of Europe to enter—in this case possibly because the big sphinx is too tough for them to harm. They tolerate ants. Do they, to anyone's knowledge, harm the wax moth? Italians will clean them out, but may that not be done entirely by destroying the young larvae or even the eggs?

Whatever the explanation, their tolerance of that bumblebee was a strange thing, and we must not forget that in the realm of biology, from human physiology and psychology to the instincts of insects, it is the exceptional or abnormal that throws most light on the normal. For this reason I feel it is the duty of every beekeeper to report all exceptions or anomalies observed in bee behavior. Robert W. Hall.

Bethlehem, Pa.

FROM THE FIELD OF EXPERIENCE

MIDSUMMER NECTAR

Plants That Secrete Well During the Hot Weather Season

Concerning the gap between the spring and fall honey flows, mentioned editorially in October Gleanings, in this part of the South at least, it is a result of a lack of flowers rather than of high temperature.

Our spring flow ends early in May, and our fall flow does not start before about the first of October, which leaves quite a gap between these two flows. However, horsemint, eryngium, cotton, balloon vine, and other plants usually give us several respites from the summer dearth of nectar. Horsemint is a plant that likes hot weather—the hotter the weather, the heavier the yield, just so it is not too dry. During July, our hottest month, we often get a flow from a plant known locally as purple thistle (*eryngium leavenworthi*). I have observed that this plant furnishes the greatest amount of nectar during extremely hot dry weather. When the July sun, pouring his vertical rays upon a soil already thirsty from weeks of dry weather, causes the surface to open in a network of fissures; when the wonder is that any plant can survive; there are conditions ideal for a heavy flow from eryngium.

Take cotton for another instance. Altho we are outside the regular cotton honey district, we occasionally get a nice flow from this source in July and August. The conditions for heaviest nectar secretion are as follows: Topsoil rather dry, thus retarding plant growth somewhat, causing a heavy fruitage; temperature high, with some humidity but no rain.

There are several other midsummer blooming plants of minor importance in this locality, the majority requiring hot weather for normal nectar yields.

If we ever succeed in closing the gap between the spring and fall flows by the cultivation of various plants, we shall have to make use of such as have their regular order of blooming during the hot months. Neither sweet clover nor buckwheat will answer for this purpose until a Hughes or a Burbank convinces them that midsummer is their proper blooming season. J. D. Yancey.

Bay City, Tex.

* * *

A CHEAP WINDBREAK

Corn Fodder Stored Against Fence an Efficient Protection Against Wind

For a windbreak I set posts and put up three rails. I then stand corn fodder against the rails. The taller the fodder the better, but it should not be too thick. I leave the fodder up till the weather is warm enough to take the hives out of the winter cases. I take them out a week before removing the fodder, about May 10.

The day the photos were taken I used two thermometers, placing one on the northwest side of the windbreak, and the other on the sunny side. There was a stiff west wind blowing and the thermometer on the sunny side registered 14°, while the one on the windward side stood at zero. This was at 10 a. m.

I use double packing cases since I do not like the quadruple case on account of having entrances on the cold sides. In the double case the entrance is on the warm side. I face the entrance to the southeast.

It was below zero and the wind blowing when this picture was taken, but the bees in the double packing cases shielded by the corn fodder didn't know it.

My cases are packed with sawdust, four inches on the entrance side with six inches on the other three sides, four inches under, and ten inches on top. The only objection I have is the first cost of the cases, but this is soon paid back by the amount of honey saved, for I can winter a 10-frame colony on from 12 to 15 pounds till the middle of March. This has been the average the past two years. The trouble we have here is to get the colony built up in time for harvest, but with good packing and early stimulative feeding this can be overcome. I begin feeding about the first of April, using a ½-gallon syrup bucket inverted over the hole in the inner cover, feeding syrup two and a half parts of sugar to one of water at first, and weaker later in the season. I put on a second story while the hive is still in the winter case as soon as the colonies need more room. Sterling Rouse.

Ludlow, Ky.

SIFTINGS

J. E. Crane

I HAVE just received a letter from H. E. Weisner of Tucson, Ariz., in which he says: "I fear the concluding sentence of your page in September Gleanings may cause trouble in some parts of the country, for while it may do very well in your locality to give a ripe queen-cell to a colony less than two days after the removal of the old queen, there are other places where it would mean 75 per cent failure. I kept bees in western Oregon before coming here, and there are a number of rules, considered orthodox by noted beekeepers, that will not work out right there, and requeening cells is one of them."

* * *

On page 681, October Gleanings, F. Greiner discusses a most interesting problem as to whether a small brood-chamber is not preferable to a large one for wintering. I have believed for many years that a small brood-chamber is much to be preferred where bees were wintered out of doors in our cold climate. My attention was called to this subject many years ago when one spring I found in an outyard every colony that had been left on eleven combs dead, while those on eight combs or less had wintered fairly well. In my opinion it is poor policy to try to warm a large room with a small stove. Either the room will be cold or you will burn out your stove trying to keep it warm. In practice we try to reduce our brood-chambers to the size of our colonies—ten frames for very strong ones, seven or eight for those of average strength, and from four to six for weaker ones. If they have good food and are well packed they winter very well. It is an easy matter to enlarge the brood-chamber in spring as they need it.

* * *

J. Raymond Ball of Knowlton, Quebec, is wondering (page 643) if J. E. Crane's prediction of a poor season following an early spring, has come true. Well! I am glad to report that the season has not been an entire failure, altho very far from what we might call a good one; in fact, the poorest we have had in the past six or seven years. We have from one-third to one-half of a good year's surplus. The late bloom of clover has helped out some, so we shall not have to feed as much as usual.

* * *

I enjoyed immensely the introduction of Prof. Hughes to us beekeepers by E. R. Root, on page 622. Hereafter we shall feel that we know him and shall regard him as a personal friend. But isn't that picture of him just great? Aside, Mr. Root tells us that Prof. Hughes is one of the finest Christian gentlemen he has ever met; that he believes in the sermon on the mount and practices it. Today the world is full of trouble, poverty, and sorrow untold, and is looking in every direction for some remedy, but so far has seemed to overlook that little rule laid down in the sermon on the mount, "Thou shalt love thy neighbor as thyself."

* * *

"Shall we eliminate the word extracted from honey labels?" asks the editor of Gleanings, on page 614. For one I say, yes. As I understand it there are many times more pounds of liquid or extracted honey produced today and placed on the market than there is of comb honey, and there is likely to be a still greater amount. The time was when market honey always meant comb, but times have changed. Let the word "honey" stand for that produced in the largest quantity, and a qualifying word to that produced in smaller quantities. The demand for honey in tins is increasing rapidly.

* * *

I enjoy Mrs. Boyden's "Food Page," altho I am not a cook. I have especially enjoyed the page for October and her frank and open statements that honey is not altogether satisfactory for general cooking where sweet is needed, without regard to what "the editor might think or say." Right here I want to tell of a new use for honey that I learned down in Connecticut a few weeks ago. It was to pour a tablespoonful of nice honey over a dish of ice cream. That which I tested was certainly delicious. I was told that some one who had introduced the custom or fashion in a cafeteria or restaurant had reaped a rich harvest of nickels or dimes as the extra charge for the superior quality of such ice cream.

* * *

I was glad to learn from "North, East, West and South" that the home demand for honey is on the increase. In Michigan not over 10 or 15 per cent will be sent to the large cities. We have never before had so large a sale for honey in tins. It looks now as tho two, three, and five pound tins were to become the most popular of all packages for honey.

* * *

I was amused a few days ago when an automobile party called and inquired if we had honey for sale. When informed that we had, the question that followed was, "Where are your bees?" After opening the back door to the honey-house, so they could see the hives, I had no trouble selling them all the three and five pound tins of honey they could carry.

OUR FOOD PAGE

CONSTANCE ROOT BOYDEN
(Stancy Puerden)

HAVE you a pet economy such as turning out the hall lights at the risk of your husband's tripping over the furniture, saving bread crumbs or using egg shells to clear coffee? If you haven't, now is a good time to start such a pet and it might be well to adopt some pet economies of your neighbors as well. Several years ago we economized because the cost of living was soaring away above the average income. Now that the average income seems to be volplaning down much faster than the cost of living, it is up to us housekeepers to be still more economical if we do not want our household finances to take a nose dive to disaster.

After all, economy is not a bad word at all. It is not penury or stinginess. Economy is the use of our resources, whether money, time, strength, or anything else, to the best possible advantage, which covers spending as well as saving.

Suppose we consider just a few of the many ways in which we can reduce the cost without lowering the standard of living. In the first place, it is unwise to cut down on the quality of food or skimp the quantity. Milk, butter, eggs, meats, or other tissue-building foods, vegetables, and fresh fruits in season are among the necessities, and beekeepers at least would add honey to this list. But luxuries, such as rich and indigestible desserts, canned relishes and condiments, expensive fruits and vegetables out of season, candies, etc., may be cut down without injuring anyone unless it is the family doctor or undertaker.

If we wish to feed our families economically it is necessary to have a knowledge of food values in order to be able to substitute cheaper foods for expensive and yet assure a balanced ration. Also, if certain classes of foods are omitted from the diet while others are served to excess, nature creates a feeling of dissatisfaction which results in a constant craving, altho the unfortunate may not realize why he is always hungry. He may be actually starving while eating to excess every day. Fed on a balanced ration that same person will eat much less, feel satisfied, and enjoy better health.

THERE are many ways in which the meat bill can be kept down without danger of malnutrition. Meat substitutes, such as fish, eggs, milk, cheese, nuts, grains, dry beans and peas may be used. While authorities differ as to the importance of meat in the diet we all know healthy individuals who eat practically no meat, and it is rather significant that centenarians almost invariably state that they have eaten very little meat.

The meat flavor may be extended by combining meat with vegetables, noodles, macaroni, dumplings, and biscuit dough in meat pies, etc.

Insist on having all trimmings sent with your meat when ordering. You pay for them at the rate of the meat from which they are trimmed. Savory stews and soups may be made with the bones as a foundation, and the fat may be tried out for use in cooking or for homemade soap.

Save every scrap of cooked meat. After serving the best portions sliced cold the rest may be cut up, and if tough, simmered in a very little boiling water with or without vegetables until tender, and then used in any way desired. Less desirable pieces will add flavor to soup stock.

Don't confine your orders to the so-called best roasts and steaks. Other portions of the animal are quite as nutritious, just as tempting if properly prepared, afford an agreeable variety to the diet, and are much cheaper, altho one must take into account the fact that certain cheap portions have so much waste that there is little or no economy in buying them.

EGGS are such a valuable food that at this time of year, when their price is almost prohibitive, it is wise to use them as the main dish at a meal rather than as a part of a more or less indigestible dessert. When used in custard or ice cream serve a meal which is otherwise light in protein.

(Don't put food over a gas burner without an asbestos mat, go into another room, become interested in writing an article on food economy, forget the food cooking on the range and let it scorch. This bit of advice was born of experience, for I have just this minute done it.)

The ready-to-serve breakfast foods are great time savers, but the old-fashioned rolled oats, cracked wheat, and cornmeal mush are nutritious, afford variety, and help keep down the food bill, especially if they are homemade on a hand gristmill run by boy power.

Use an abundance of fresh vegetables, including the leafy, uncooked vegetables. Their value in the diet is quite out of proportion to their cost. They provide us with the necessary soluble minerals and vitamines, help to counteract the acid-forming properties of meats and grains, and thus keep the blood stream alkaline and able to resist disease, and furnish "roughage."

ACCURATE recipes, carefully followed with the use of standard, graduated measuring cups and spoons, prevent waste of materials and tend to eliminate failures in baking. A card index of recipes which you have tested yourself is a time and money saver, as each recipe is where you can put your hand on it instantly, and the recipe may be changed or renewed without spoiling its appearance.

The following recipes should suggest ways of using some of the cheaper cuts of meat, meat left-overs, and substitutes for meat. If you are not well informed as to the cheaper cuts your local market man will be glad to tell you something about them.

The cake recipe produces an article which is light, tender, and of fine grain altho inexpensive and very quickly made. Made with butter it of course has a little finer flavor, but the flavor may be obtained by using half butter and half margarine. Butter is so much needed on bread and for seasoning vegetables that it seems wise to use a substitute in baking, especially as the food value of butter is injured in baking.

CASSEROLE OF BEEF OR MUTTON.

1½ lbs. forequarter beef or mutton
Fat
3 onions sliced
2 small carrots sliced
3 potatoes sliced
¼ cup dried corn, soaked
½ teaspoon Worcestershire sauce
Salt

Trim and cut the meat in inch cubes and brown in the fat in a hot frying pan, remove to a casserole and cover with boiling water. Add the onions and carrots, cover and put to cook in a rather slow oven. When the meat is tender, which should be in about two hours, add the potatoes, the dried corn and the seasonings, after simmering the corn and the water in which it was soaked in the frying pan about five minutes to take up the juices of the meat, cover and return to the oven for 30 or 40 minutes. With a green salad, bread and butter and a simple dessert this will make a balanced dinner. Or honey may be served with the bread and a fresh fruit for dessert.

Turnips may be substituted for the carrots and the dried corn may be omitted. If mutton is used a cup of canned peas may replace the corn.

BEEF POT PIE WITH DUMPLINGS.

2 lbs. lean beef
4 tablespoons flour
Salt
Pepper
Boiling water

Cut the beef, which may be a cheap piece from the forequarter or lower round, into pieces suitable for serving, trimming neatly; place in a good-sized kettle with a close fitting cover and pour in boiling water to just cover the meat. Let it boil about five minutes, skim the liquid and then reduce the heat and simmer until tender, which will probably take three hours or longer. This may be done in a fireless cooker or pressure cooker. When the beef is tender, season to taste and thicken the broth with the flour stirred to a smooth, thin paste in a little cold water. Prepare the dumpling dough and drop over the meat from the tip of a spoon, cover closely and let cook undisturbed for about 15 minutes. Serve the dumplings on a large platter with the meat and gravy over them.

DUMPLINGS FOR POT PIE.

2 cups sifted flour
4 level teaspoons baking-powder
½ teaspoon salt
1 tablespoon shortening
1 beaten egg
About ¾ cup milk

Sift together the flour, baking powder and salt, cut in the shortening with 2 knives; add part of the milk to the egg and use to mix the dry ingredients to a soft dough, adding more of the milk as needed. The egg may be omitted, but it is a great improvement as it prevents the dumplings from becoming soaked.

BROILED HAMBURG STEAK.

1½ lbs. lean beef
1½ oz. suet
Salt
Pepper

Put the beef thru a food chopper together with a small piece of suet. This is much superior in flavor to the sawdust-like article which is commonly known as Hamburg steak in the market. A bit of onion may be used as flavor if desired. Shape the beef into a flat cake about ¾ inch thick by pressing gently on a large plate. Keep the edges as thick as the center, if possible. Heat a cast-iron frying pan hissing hot, grease it, transfer the beef cake to it and slip the frying pan under the broiler of the gas range, putting the broiler shelf as close to the broiler flame as the sides of the frying pan will permit. Cook until done to taste, which will probably take five to ten minutes. If it browns on top very quickly it may be necessary to lower the flame of the broiler a little in order to cook it sufficiently in the center, but take care not to let it cook too dry. When done transfer to a hot platter with a pancake turner, dot with a little butter and season with pepper and salt. Serve at once. For a person of weak digestion it is well to leave out the suet. If a gas broiler is not available the beef may be made into a number of little cakes and pan broiled on both sides.

BAKED SAUSAGE AND TURNIP.

3 or 4 turnips
1½ lbs. link sausages
Salt
Pepper

Pare and boil turnips, mash and drain and season lightly with pepper and salt. Place in a buttered baking dish, cover with sausages, which should preferably be the small ones, well seasoned with sage, prick the sausages with a fork and bake ten or fifteen minutes or until the sausages are done. The drippings from the sausages will take the place of the butter which would otherwise be needed in seasoning the turnip. With this serve baked potatoes and green salad or fruit.

CHEESE PUDDING.

3 large or 4 small slices of bread, lightly buttered
½ teaspoon salt
⅛ teaspoon dry mustard
1 cup thinly sliced cheese or about ¼ lb.
2 eggs
2 cups milk
Paprika

Pile the slices of buttered bread one upon another and cut thru all into strips and then squares. Arrange the bread and cheese in alternating layers in a baking dish. Beat the eggs slightly, add the milk and seasonings and pour over the bread and cheese. Bake slowly until the custard is set and serve hot.

RUMMAGE STEW.

1 cup any kind of cooked meat, cut small
¼ cup thickened meat gravy
3 baked potatoes, peeled and diced
⅔ cup boiled rice
½ cup water in which rice was boiled
2 small slices cooked bacon, diced
3 small or 2 large onions, sliced
2 tablespoons dried corn
1 tomato
½ teaspoon Worcestershire sauce
2 bouillon tablets
Salt to taste
Water

When you have several meat and vegetable leftovers, such as the first 6 items, mentioned above, combine them, add the onions which have been parboiled, the dried corn, tomato and seasonings and simmer until the onions are done and the flavors blended. Add the bouillon cubes just before you remove from the fire. Almost any combination of vegetables may be used and several kinds of meat. If you have soup stock on hand the bouillon tablets will not be needed.

(Continued on page 729.)

Beekeeping as a Side Line

Grace Allen

DOCTOR, lawyer, merchant, priest'' — somewhere in the ranks of every profession one finds a sideline beekeeper. In Bowling Green, Ky., lives a lawyer whose bees have been the ''open sesame to broad fields of never failing eternal interest.'' From musty archives he has turned to the green beeyard, from the technicalities of the courtroom to the directness of the bee on the wing, from the contentions of wrangling humans to the harmony of the hive. And it has meant rest and refreshment of soul as well as the widening and deepening of personal interests.

Ten or twelve years ago, when he had been practicing law for 16 years and felt the need of a breath from out-of-doors, Mr. John B. Rodes bought his first hive of bees, ''an old-fashioned box set on legs, with little boxes for the surplus honey in the super.'' The new venture came about thru an old farmer friend, a sort of philosopher of the soil, who had roused his interest in trees and weeds and wild flowers and birds and now finally in bees. ''I recall he charged me $8.00 for this old box hive,'' Mr. Rodes writes. ''But what then? I would have paid him $15.00 just as readily, and today would not part with the old box for $20.00. Memories are worth more than wood.''

For four years he did nothing with his bees except watch them with increasing interest from the outside—no glimpse within. Then he bought a dovetailed hive with movable frames and discovered a new field open before him. He promptly bought all the standard books on beekeeping and soon found his interest ''established forever in these little insects, and as long as life lasts my love for them will never fail.''

''I am asked,'' he continues, ''whether my bees are for money or for honey or for fun. Up to the year 1918 I never attempted to make any money out of them. I have taken much pleasure in good honey, and presenting the same to my friends, but I doubt if the books had been kept against me I could have come out even. No, I would never keep bees for money. . . . But if a man wants amusement and interest in life, and development of that secret thing that lies in the soul of every man, and which testifies to his kinship with nature by the very love he finds there for all living and growing things, then it is profitable to keep bees.

''The bees have planted in me what has been called the 'lure of the unending quest.' I have followed them in their flight and been led into studies of birds that prey on bees. The worst enemy of the hive that flies in the air is the summer tanager, clothed in scarlet and flashing like fire. In the evening twilight, as dusk is gathering, you hear him clucking in the shadows of the trees. Last summer a male sat upon my hive, within ten feet of me, and continued to swoop down upon the incoming bees as they slowed up to enter their home, until he had gathered some twenty or more in his craw. I murdered this bird. . . .

''And I have followed the bees to the flowers, and I now recall my first glance into the tulip flower of the poplar, and my wonder at the perfect understanding between the bee and the tree.''

In conclusion Mr. Rodes says that he is neither an expert nor a professional beekeeper, but he thoroly understands what lay in the heart of Virgil's ''old Corycian,'' living on his few acres of poor soil, where, ''planting a few herbs, white lilies, vervain and esculent poppies, he equaled in a contented mind the wealth of kings.''

Woman Doctor-Beekeeper.

Down in San Antonio, Texas, lives a physician, Doctor Charlotte Strum. After years spent in the practice of medicine, Dr. Strum found in bees the very interest she needed, just as Mr. Rodes did after years of law practice. She isn't a very strong woman, anyway, and has to limit her practice to that of the office, just because by the time that is done there is no strength left for outside work. She lives in an apartment where no dogs are allowed; she cannot bear cats, hates the sound of a parrot, prefers birds out-of-doors, and so had no growing thing to care for except plants. These kept accumulating until it sometimes looked as tho either she or the plants must move out, when she would gather a lot of them together and give them away.

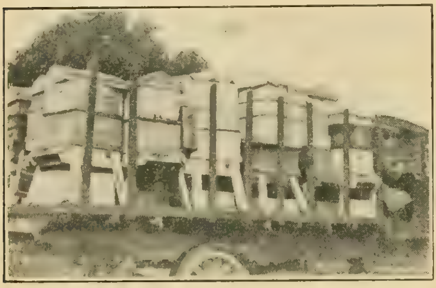
But one day someone showed her an observation hive with bees inside. She was fascinated with it. Then and there the magic came into her life. Promptly she bought one like it. Someone said she was about to become a ''backlot buzzer,'' but how could she? She hadn't even a back lot to buzz in, only a sleeping porch. So there she placed her new hive, the entrance outside and the hive itself within.

About that time a meeting was called for the organization of a honey producers' association. And Dr. Strum, possessing one observation hive, went to the meeting. And subscribed for five shares of stock! There's genuine enthusiasm, sure enough, the royal generous unhesitating kind that does things. Since that time she has increased not only her colonies of bees but also her shares of stock. And she is glad she bought that first observation hive, for ''this interest has opened the great out-of-doors to me and benefited me very much.'' She now rents several apiary sites, having 40-odd colonies on each, and is one of the incorporators of a company, with a manager to look after the apiaries.

''Bees mean a great deal to me now,'' she writes. ''Started merely as something alive to watch, they have grown and become very much more than that. . . . When I give up my profession, I want a garden and some colonies in it, and, when I am gone, someone to tell the bees of my departure!''

New Zealand Sideliner.

Miss Mabel Shepherd of Southbrook, Canterbury, New Zealand, is neither a doctor, lawyer, merchant, nor priest, yet she is a most interesting beekeeper. Someone may question whether, with more than 200 colonies, she is really a sideliner. But she declares herself that she is maid of all work in the home, having only occasional help with the housework, and any woman will know that anything else is almost necessarily a sideline. Surely that must be particularly true on a farm—and Miss Shepherd's two brothers are farmers. It did seem queer, by the way, to read in a letter dated January 21, ''Harvest time is just commencing,'' tho what followed was more comprehensible —''and it is our busiest time, as all cooking for the harvest hands is done in the home.''



Miss Shepherd had 90 colonies moved in one day by motor truck carrying 20 colonies each trip.

Miss Shepherd has three yards. She decided that to be successful to any large degree in honey production, she must do it on a broad enough scale to pay to hire the hard work done. New Zealand does a large export business, and this trade requires honey to be in cases containing 100 pounds net of honey. It takes strong men to handle tons of honey in 100-pound cases. So she has branched out to three yards, altho, as she puts it, ''I am only in a small way compared to some of our beekeepers in New Zealand, especially in the North Island—but success is not to be had anywhere without hard work, and plenty of it.''

The queen-rearing yard is at home, and queen-rearing is the end of the work that Miss Shepherd likes best. She got her start with fine queens from the A. I. Root Company. There is also at home a honey-producing yard of 90 colonies that had to be moved there about a year ago right during the honey flow. Then there is a small yard of 30 or more colonies about four miles away. They take a small hand extractor there and work right out in the open under the trees. In the evening one of the brothers comes out in a spring cart and carries home the honey, which is strained and put up at home. Still another yard of about 90 colonies is 25 miles away. There are permanent buildings for camping in (doesn't it sound inviting?) as well as an extracting house with a 4-frame friction-drive extractor and a room for storing the honey.

It is always easy, she says, to get plenty of help from neighbors, who like a change for a few days and don't mind the extra pocket money either; and when they go to this distant apiary, which is ''close to beautiful bush'' (doesn't it sound attractive?) they usually have their car full of people ready for a jolly combination of camp life and bee work. For beekeeping, Miss Shepherd insists, ''can be made one long picnic among beautiful surroundings if cheery associates are chosen for helpers. And the stings play no small part in the production of fun.''

Isn't that a fine strong robust view of one's work? But what else than a fine strong robust view of life would be expected of anyone having such a mother as Miss Shepherd has? They are in partnership with the bees, these two, and many a trip the mother takes to the outyards with the others. She wires all the frames and ''is the general inspiration of the place.'' Let the beekeepers of the world stand with bared heads before the thought of this mother wiring frames on the happy cheerful New Zealand farm—*totally blind*—''and the general inspiration of the place.''

Miss Shepherd's 90 colonies on the night they arrived home.

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In Southern California.—The demand for honey shows some activity, with the prospect of growing stronger as the winter comes on. Especially is this true of the orange honey. About ten cents seems to be the selling price in carlots. Only a few cars of the orange honey are still in the hands of the producers.

Now that the season is practically over, I see no reason for changing my early estimate of 25 per cent of a crop for the State as a whole. This seems small indeed, and is perhaps one of the lowest records since the industry has been of importance. The great variety of climate and the different sources of nectar found in our State make a failure almost impossible.

Inquiries have been sent out by a large California company desiring to buy bees in any number up to 1000 or more colonies. This shows interest and confidence in the industry, and, while we may not always desire to sell, it is ever a satisfaction to know that one could sell if he wanted to do so.

A meeting of the Riverside County Beekeepers' Club was held in Riverside on Oct. 1. Plans for the club exhibit were discussed, and arrangements were made to place a creditable display of those things pertaining to beekeeping at the Southern California Fair to be held from Oct. 11 to Oct. 18. A letter was read from the inspector of San Diego County, in which he expressed his regrets at his inability to place an exhibit at this fair. He also told of his efforts to get the beekeepers of his county to exhibit at the fair recently held at Balboa Park, San Diego and their indifference in regard to the matter. Unfortunately, this is too often the case.

Reports were received that Riverside County had obtained the second prize on the feature exhibit at the State fair this year. The honey exhibit, in connection with the wonderful date tree laden with a thousand pounds of dates, was the great attraction and interested many thousands of people. All of these exhibits help, and there is no doubt but that many tons of honey are sold because of the publicity given it by these displays.

Reports were also made of the destruction of several apiaries recently by mountain fires. L. L. Andrews.

Corona, Calif.

* * *

In Pacific Northwest.—Reports from many districts in the Northwest indicate that the honey crop this past summer has been very light. The contributing causes have been various. In those sections where the main crop is taken from clover in June a light surplus was secured, due to continued cold with little rain during that month. In the mountain sections fireweed has been reported as almost a failure in most sections, altho some report a fair surplus. In the Malheur County sections the alfalfa and sweet clover crop was very light, with little promise for the future, due to the rapid spread of the alfalfa weevil which is becoming extremely serious. In this district it is probable that another year nearly 60 per cent, if not more, of the alfalfa fields will be entirely wiped out by this insect. The Umatilla district is about the only section reporting an average crop. Yakima Valley has again suffered a heavy loss from spray poison. All other factors were favorable for a good surplus in this valley.

Favorable weather during September has prevented the bees from drawing on their winter stores for fall brood-rearing, as was the case last year. However, it will be necessary for many beekeepers to feed for winter during the month of October and early November. We can not urge too strongly the necessity of every beekeeper's checking carefully upon winter stores, due to the shortage of nectar this season. An unusual amount of feeding is already being done by the more progressive beekeepers.

European foul brood has been very serious in the Willamette Valley, especially in the Portland districts. Over 50 per cent of the bees have been reported killed in some sections of the valley. Some American foul brood has also been reported. No European disease has been reported in the irrigated, alfalfa-sweet clover sections, but American is very bad in the Malheur district.

The new crop is moving well and the market is stronger. Many of the smaller beekeepers have already sold their entire crop.

The Oregon Beekeepers' Association is planning on a beekeepers' round-up, Jan. 26 and 27, at the famons Round-Up City of Pendleton. The prospects are that we will have a large attendance and a most helpful program.

During the past season eight new county associations have been formed, many of which are taking definite steps toward the appointment of county bee inspectors. Some have already had the appointment made.

Corvallis, Ore. H. A. Scullen.

* * *

In Utah.—I think I have read in Gleanings that there is no one who has as much time as the busy man, and for the past month I have been trying to prove it, but up to the present I have failed. We have just finished extracting 20 tons of honey and casing 260 cases of comb honey.

The honey season here has been above normal in the northern tier of counties, but not so good farther south in the State on

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account of frost in July in some sections and grasshoppers in other parts.

At the last session of her legislature Utah passed a law making it unlawful to keep bees in box-hives; also a law that every keeper of bees, whether one colony or more, shall register with the State Board of Agriculture and secure a license, paying for same one dollar. A license is required for each apiary, so with my four apiaries I must secure four licenses, each costing one dollar. This is done to keep tab on all bees within the State. The State inspector, acting under directions of the State Board of Agriculture, notifies all county inspectors and all county assessors, so that all bees are located, inspected, and assessed. The law seems a little cumbersome, yet it appears to be working quite well.

There is some disease among the bees thruout the State, but to my mind our greatest trouble is among the beekeepers themselves. There was a large amount of honey carried over from last year; and this season, just before the new crop would come on to the market, that honey was thrown on our local markets, without any co-operation between the beekeepers, at from six to twelve cents per pound, according to how badly the producer was scared. Salesmen were sent out covering every little town, offering honey at ruinous prices until the local market is demoralized. No one but the beekeepers themselves is to blame for these conditions. The crying needs among the beekeepers of Utah are organization and cooperation. M. A. Gill.

Hyrum, Utah.

* * *

In Montana.—Montana has experienced a fair honey season, medium-sized crops being produced in most places. Bees in most sections of the State are in excellent shape with an abundance of good winter stores.

A movement is on foot to form a honey-selling organization, the main purpose of which will be to sell Montana honey in Montana. It is the intention to place a specialty salesman on the road to co-operate with the jobbers. Store demonstrations are planned, as well as the distribution of recipe books.

The Montana State College of Agriculture has added a department of beekeeping. Professor O. A. Sippel, who has been acting head of the Apicultural Department of the Ontario Agricultural College of Ontario, Canada, will have charge of the work. Spacious quarters are being provided for this department in the new biology building now under construction. An up-to-date experimental apiary is to be established at the college grounds. To Professor R. A. Cooley, State entomologist, is due a large measure of the credit for the establishment of the new department which will undoubtedly be of great value to the bee industry of the State.

The honey producers of the State were well represented at both the State Fair at Helena, Mont., and the Midland Empire Fair at Billings, Mont. About 10,000 pounds of honey was on exhibit as well as large supply displays. State Inspector B. J. Kleinhesselink was on hand with an educational foul brood exhibit, which drew considerable attention. R. A. Bray.

Big Timber, Mont.

* * *

In Texas.—This is Fair time in Texas and exhibits of bees, honey, and beekeeping appliances are more prevalent than ever before. Fairs at Kenedy, Manchester, Seguin, Temple, Dallas, and several other towns are offering a nice line of prizes for beekeeping exhibits.

A number of those living in the live-oak section tell us that there will yet be a flow from the galls on that plant. This is one of the varieties of honey we need a name for. It is not honeydew since it is not the secretion or excretion of insects, and it is not honey since it does not come from the nectaries of plants. It is strictly a plant secretion coming from the rapidly growing plant tissues forming the gall. Honeys from the sap of maple, box elder, stubs of wheat, sugar and sorghum cane, and overripe fruit are also in this class.

The condition of the honey plants has been greatly improved by the rains. If the observations of the old beekeepers are correct, moisture sufficient for a spring blooming of huajilla, agarita, and horsemint is in the ground. A good supply of water in the fall of the year is also in favor of the mesquite, altho we have no record of two mesquite years coming so close together. The large per cent of the new nectar used in brood-rearing comes from winter annuals, and this rain has given all such plants a fine start.

There never was a time before when bees changed hands as they are now. Quite a number of apiaries have changed owners and numerous deals are pending. The purchase price in every case has been good.

Sometime ago I said Texas was the ''too'' State. Well, it has ''tooed'' again. For a month and a half, heat and drouth stopped all honey flow, making it impossible to finish taking the crop of honey. It looked as if there would be no fall flow, and many expected to feed in order to get winter stores. On September 8 and 9 light showers fell over most of the State, and the night of the 9th it ''tooed.'' A rain ranging from four to thirty-two inches of water, according to the United States Weather Station reports, fell over a large part of the central portion

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of Texas. In a few hours, floods, washouts, and wrecks were the order of the day. The one redeeming feature of the storm was that no wind accompanied it, with the exception of one small locality near Austin. We have reports of only a few losses of bees by the flood. This moisture threw many plants into bloom, and by September 20 a good honey flow was on all over the State. Cotton, brazil, granjeno, white brush, sumac, and broomweed are giving a surplus. This flow promises to be prolonged, and the beekeepers are planning to get most of their partly filled supers completed.

Last spring the beekeepers taxed themselves a cent a hive for State advertising. This money was spent in publishing a recipe booklet for the use of honey. These booklets will be distributed at the Dallas Fair. The same booklet, including an ad, will be issued by a number of honey producers. Already 15,000 of these books have been contracted for. The effect of this, together with the American League advertising, is already felt as the demand for honey is rapidly increasing.

Among the plants blooming after our big rain is *Eysenhardia amorphoides*. The only common name we know for this species is Rock Brush. This name cannot be relied upon, however, as several other kinds of rock brush are common. This species has leaves somewhat resembling catsclaw and a cluster of bloom reminding one of white brush. It has no thorns and has a peculiar odor. The plant is a legume and is much visited by bees. It blooms in May and June and again when rains come in the fall. Two beekeepers report a surplus from it. Old beekeepers who are good observers say that this plant is rapidly increasing in numbers especially between San Antonio and the coast. H. B. Parks.

San Antonio, Tex.

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In Iowa.—This season will go down in history at the Pangburn apiary as the poorest year we have ever had. We have not extracted a pound of clover honey, and there will be but little of the fall crop that the bees will not need to bring them thru the winter. The bees, however, are in fine condition for winter, provided they are given plenty of stores. Colonies are full of young bees; in fact, they are better than I expected, and I would now say they are fully up to normal; but beekeepers will do well to examine closely and make sure they have plenty of honey, as they are unusually light in stores this fall.

The honey crop in this State has been spotted. About 35 miles east the crop was much like it was with us, and 35 miles west they were getting a good flow while we were getting nothing. The flow seemed to get better west, at least as far as we have had any reports. Local showers were the rule this summer with us, and I have never seen a good honey flow with these conditions. The season was too dry during the time when the honey flow should have been on; besides we did not have the clover we had last summer, for some reason which I cannot understand. The clover looked fine this spring, but many fields that had plenty last season scarcely had a blossom. We have had a superabundance of rain the past month. The ground is soaked and clover is surely looking fine, so we are living in hopes as all true beekeepers do.

Honey sales have taken a decided change from several months ago. Local demand has been good the past two weeks, as well as mail-order business. It begins to look as tho honey is going to move this fall and winter. I again say, as I said in a former article, that beekeepers should keep their heads and not slash prices below reason, because it will all be sold at a reasonable price before another crop is harvested. Beekeepers must be mindful of the fact that we cannot produce honey and sell at prices that prevailed before the war, and pay the prices for supplies that are being asked. Honey should never again sell at pre-war prices, and it never need sell again at those prices if beekeepers do a little work along educational lines. Read again in October Gleaning's Editor Demuth's editorial on ''Honey deserves to be better known.'' It is a shame to us beekeepers that it is not better known. Who's fault is it? ''Brethren, these things ought not to be.'' If honey were as well known as many other articles of food that people buy as necessities and which contain far less food value than honey, there would not be enough to go around once. ''Let us put it over.'' W. S. Pangburn.

Center Junction, Ia.

* * *

In Wisconsin.—Wisconsin beekeepers have just passed thru one of the most peculiar seasons ever witnessed in this State. The winter of 1920-21 was very mild, and the bees were able to fly practically every month of the year, but the mild winter was very hard on the clover and most of it was frozen out. Spring conditions were good, and the bees should have built up in splendid shape; but, because of the mild weather, they consumed stores rapidly and in the great majority of cases did not have sufficient to build up on.

In a number of cases where beekeepers fed sugar or honey, the colonies were very strong at the beginning of the honey flow and produced a fair crop even in the poorest localities. During the time of the clover bloom the weather was very hot and dry, with little or no rain, and very little surplus was secured. By August most of the beekeepers in unfavorable locations had decided that they could not possibly get a surplus and would probably have to feed their bees. However, fall flowers came on early and secreted nectar freely. One beekeeper reports having secured 700 sections of honey after the middle of August in the vicinity of Madison. This apiary was located near low marshy ground where the soil moisture had not been greatly reduced.

The buckwheat honey flow was good and practically every beekeeper in the buckwheat sections secured a fair surplus. During September we had an unusual amount of rain, and the clover and other honey plants are at present in excellent condition.

It is quite likely that some of our beekeepers will come to grief this winter, unless they have held back stores or feed the bees sugar syrup. The weather continued warm and up to October first we had no frost. The bees are still rearing large amounts of brood, and many colonies will go into winter quarters strong in bees, but short in stores unless beekeepers are extremely careful.

Reports indicate an unusual variation in production. Racine, Milwaukee, Washington, Ozaukee, and Sheboygan counties were favored with a good honey flow. The southwest portion of the State and the western tier of counties were away below normal in production, while the northern tier of counties are high. The early yield in the north-central sections was very poor, but all of the good beekeepers were able to secure a surplus from willow-herb and other late summer flowers. The yield for the entire State is less than 40 per cent of last year, and with the exception of Milwaukee and adjoining counties the crop was not more than 50 per cent. A few reports have been turned in showing that it was necessary for some even to feed their bees during the summer.

Lack of organization and co-operation among beekeepers is well demonstrated by the reports on prices. No two beekeepers in any one county seem to have the same standard for prices either wholesale or retail. Prices for the State vary all the way from 16 cents to 35 cents wholesale for comb honey, and from 20 cents to 35 cents retail. Prices for extracted honey run from 12½ cents to 20 cents wholesale, and from 12½ cents to 35 cents retail. One beekeeper reports retailing at 18 cents in 5-pound pails. With such a variation, it is evident that honey prices cannot be stabilized, and in some counties where there is practically no crop at all, beekeepers who have small amounts are offering it at ridicuously low prices. Some beekeepers who report low prices claim that they cannot find a market for their honey, and that the local market will take care of only small quantities. This in spite of the fact that in some counties there is no honey at all.

Lack of co-operation and a marketing organization to stabilize the price and to secure distribution is evidently responsible for this condition. An organized selling agency should help a great deal in eliminating this situation, and we all hope that within the next few years our beekeepers will become aware of this fact and will unite in a statewide marketing organization.

Madison, Wis. H. F. Wilson.

* * *

In Michigan.—Colonies went into winter quarters last fall in excellent condition both as to the age of the bees and the quality and quantity of stores. Then came one of the mildest winters ever known, and the colonies naturally came thru in fine shape. The spring was early as a result, and the bees were gathering pollen in late March, tho it is not unusual for them to be held off until late April or early May.

With this exceptionally favorable start, had not the weatherman been partial to some localities and passed the drouth to others, a bumper crop would surely have resulted for Michigan; but unfortunately this particular location got practically no rain in June and July, resulting in a very light crop of white honey. By the way, when the crop is light, the color is always darker and vice versa. The fall honey plants got a very slow start, and the buckwheat that was sown lay in the soil without germinating; whereas, where the soil was naturally moist, everything advanced quite naturally. Then came the rains and favorable weather and the fall plants took a new life; the buckwheat germinated, and fields of this dark honey-secreting plant were in all stages of growth, resulting in a continuous flow until late in September, there being no frost to cut the bloom even at this date. So bees are again going into winter quarters in fine shape.

Now what about the disposition of the honey crop? What we require more than anything else is organization, co-operation, and a well-worked out per capita distribution of our honey. With sugar continually declining and no acceptable offers from the extensive buyers, every beekeeper from the backlot producer to the specialist got out and hustled. With no understanding as to prices they should receive, each one got what he could and with the continuous advertising and soliciting practically all honeys are sold excepting a portion of the dark. One person with some three to four hundred colonies told me that he had two chances in one day to sell his entire crop, after he had it pretty well disposed of, to local parties who wishes to pail it up and

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sell from house to house. Now they are wondering if they really were wise in getting rid of it so cheaply as they did.

Here is the point: We have several thousand colonies in this immediate vicinity, and the honey produced has nearly all been sold locally at a lower figure than was necessary; where but a short distance away in a much heavier populated district with few bees, in town after town and city after city, practically no honey may be found, and many merchants informed me the reason was that no honey had been offered them.

I am still of the opinion that our delicious product, if properly distributed, would bring a price commensurate with its value as a food and with our labors to produce it, even if several times as much were produced as there is at the preseut time.

East Jordan, Mich. Ira D. Bartlett.

* * *

In Indiana.—In this locality, northwestern Indiana, very little nectar was gathered from fruit bloom. Bees began the clover harvest greatly weakened in numbers, many colonies being on the verge of starvation. A good alsike flow, followed by basswood and an exceptionally good yield of sweet clover, enabled them to store a considerable surplus, amounting to 100 pounds per colony in some yards, with very little swarming. Then followed more than a month of exceedingly dry weather, in which much of the surplus was consumed by the bees in brood-rearing, resulting in enormously strong colonies just at the opening of the fall flow. Heavy rains in August brought the nectar, and the final result is probably the heaviest yield from fall flowers ever obtained in this locality, many colonies having a surplus of 200 pounds or better.

The hot weather thruout September has resulted in colonies exceptionally strong in bees, with very little honey in the brood-chambers. Almost all of the honey being in the supers will, of course, necessitate a great amount of feeding if bees are to be wintered without loss from starvation.

European foul brood, so prevalent a few years ago, seems to be disappearing with the introduction of Italian stock. In fact, there is very little to be found except among dark hybrids. American foul brood seems to be spreading rapidly in this part of the State, and it appears that some apiaries will be entirely wiped out. This, apparently, is one of the results of encouraging everyone to keep a few bees. Most amateurs and the box-hive fellows produce very little honey but plenty of infection.

Practically all honey in this locality is sold locally, or in mail-order shipments or to tourists. I know of none being shipped to wholesale markets. The demand this year, both for comb and extracted, seems very much better than usual, and many tons are being disposed of.

A course in beekeeping is to be introduced in Valparaiso University this year. I understand that quite a number of students are contemplating taking the work, many of them being ex-service men. E. S. Miller.

Valparaiso, Ind.

* * *

In Georgia.—The early honey crop in this part of the South has been from 50 to 60 per cent below normal, caused by untimely frosts and cold weather late in the spring. Further north in this State the crop was more nearly normal. The cotton in this vicinity has since yielded pretty well for a short time, followed by an unusually good yield from velvet beans; but the bees acted as tho they expected winter soon, crowding the queens to a great extent altho the weather was very warm. Later, came drouth when the bees could get little or nothing for two or three weeks; and now this is followed by a rainy spell, and the bees are gathering pollen freely but very little nectar. They will probably raise a good amount of brood before cold weather comes and be in fine shape for wintering.

I hope the article by E. R. Root in last Gleanings will rouse an interest in sweet clover culture all over the country. I have tried but never succeeded in getting it to grow in this ''Coastal Plain,'' and know of no one that has. I have bought some seed of the ''Hubam'' variety and intend to try again—this time liming and inoculating the soil. I hope all who can will do the same. It would be a very great thing if this plant were largely cultivated all over the South (and North, too), as it would make much territory available for honey production and greatly improve other territory that is now inferior.

The Georgia Beekeepers' Association, at their meeting in Macon on Aug. 19, were tendered the use of a good-sized building by the Georgia State Fair Commission, for apicultural exhibits at the State Fair, Oct. 27 to Nov. 5 inclusive. Commendable efforts are being made to give there a creditable exhibition of apicultural products. The Beekeepers' Association has made notable progress since its inception and we hope great things for its future. T. W. Livingston.

Harmon Park, Ga.

* * *

In New York.—Beekeepers in the New York region are unanimous in the opinion that this has been a queer season. All kinds and degrees of honey crops from none at all to a bumper yield have been observed. In all, the aver-

FROM NORTH, EAST, WEST AND SOUTH

age crop is far below normal. It probably will not total over 40 per cent for white honey and about normal for buckwheat and amber grades.

The season all over the State has been too dry and hot—much worse in some parts than in others. Following a line east to west along the Mohawk valley and canal from Albany to Buffalo, during the early part of the summer most of this country reminded one of the Sahara desert. I don't think that I ever before saw a country so completely dried up as some portions of this region. Some places south of this line were just as dry. Thru all this region the white honey crop was almost an entire failure. A notable exception to this was the limestone areas in Onondaga County and other like spots where alfalfa and sweet clover gave a good yield.

The south-central part of the State had frequent showers at the right time to provide ideal nectar conditions. Beekeepers in this region harvested a fine crop of white honey of extra quality. The buckwheat honey crop was good in this region also, but was only from poor to fair in other parts of the State. The Hudson River valley honey crop was very poor.

A good fall flow, mostly from goldenrod and asters, nearly all over the State, has put the bees in good wintering conditions. We are advising beekeepers to feed from 10 to 15 pounds of granulated sugar syrup to each colony, to offset any ill effects that may be experienced from the aster honey.

No doubt, conditions in the colonies last spring have much to do with the poor yield. Unseasonable warm weather in March and April, with flowers blooming a month ahead of time, caused abnormal brood-rearing. By May most colonies were in June condition. Thousands of colonies used up all their stores and went down rapidly in brood-rearing. Even the provident beekeeper, who had provided an abundance against such an emergency, found a new difficulty in that the queens, apparently having done their best, grew tired and reduced egg-laying at the very time when top speed was needed. Colonies with young queens of last August were not so bad in this, and colonies with such queens and lots of honey kept up brood-rearing.

On May 17 and 18 heavy frosts destroyed much of the fruit bloom, dandelion, and early raspberry bloom at a very critical time. These sources of nectar and pollen would have put into condition many colonies that went down badly at this time. This provided a striking example of the absolute necessity for pollen for brood-rearing. Beekeepers who fed sugar syrup at this time found that the bees did not respond in brood-rearing, because all old pollen was used up and no new supply could be found. The moral is obvious—save more combs of honey and pollen in the fall.

The matter of greatest interest in all this is that the beekeeper, who requeens regularly provides ample honey, and winters his bees well, is the one who will have his "cup right side up" when the honey flow comes.

Ithaca, N. Y. George H. Rea.

* * *

In Ontario.— The month of September in Ontario was dryer than usual, with complete absence of frost or very cool weather. As a result, buckwheat with other late honey was removed from the hives with less effort than in some seasons. Generally speaking, the late honey flow was fair altho some localities never give any surplus after clover is over. This is true at our chain of apiaries southeast of Hamilton, where the main flow is from clover and the soil is a heavy clay, with no buckwheat or other late forage. In all sections where there was a late honey flow, clusters for winter are large and I suppose mostly composed of young bees, so they should winter well, provided they have an abundance of good stores.

This brings me to the question of feeding, and while feeding should have been done before this appears in print, it can be done quite late with proper precautions. In this case it surely is "better late than never," even if it is true that is "better never late." Just now (Oct. 10) we are busy feeding the bees what they need, and, of course, that means that we are feeding sugar syrup; for under no circumstances would we think of giving them the buckwheat stores out of the supers, even if we sold the buckwheat honey for less than sugar costs us.

We like to do this feeding as rapidly as possible; and to give an idea of what I mean by rapid feeding, last fall my son with one helper fed as high as a ton of sugar a day in feeding up for winter.

Some may wonder why we advise feeding sugar syrup for the cold winter months instead of using buckwheat stores when the honey is just as cheap as the sugar or cheaper. Simply because we have found that in at least one season out of three the buckwheat stores do not give good results, and in such a season the gain more than pays for all the time and extra cost taken up by feeding sugar.

Contrary to what many of us anticipated, the demand for honey keeps good and many beekeepers, including ourselves, are entirely sold out. For the past ten days we have turned down orders until we almost regret that we closed out most of our honey on a carload basis, as we dislike to disappoint customers.

Markham, Ont. J. L. Byer.

HEADS OF GRAIN FROM DIFFERENT FIELDS

Why Not Crystallized Honey? If the term "extracted honey" suggests to the consumer something a little different from pure honey, as mentioned in your editorial in October Gleanings, how much worse are the words granulated, sugared, or candied honey. Each term carries a suggestion of granulated sugar. Why not use the proper word already coined for it, "crystallized" honey? A change is easily brought about.

Surely "pure crystallized honey" would make a better impression on the mind of the consumer than granulated or candied honey.

I once suggested this in a short article to the American Bee Journal, and I notice Hoffman & Hauck have changed their ads to "liquid" and "crystallized" honey.

Audubon, Iowa. E. M. Cole.

* * *

Paraffin for Mending Leaking Sections. Leaky sections can be repaired by dipping a table knife into melted paraffin (not too hot), then applying it to the break by a downward motion until the break is covered by a thin film of paraffin. Some irregular sections can be cut straight with a hot knife and then covered by paraffin in this way and so made marketable. Some breaks can be stopped by dropping melted paraffin on them.

There is another use for paraffin in comb-honey production, which we have employed for two or three years. When supers are filled with sections and the springs are in place we apply melted (hot) paraffin with a brush on top of the sections, which makes cleaning comb honey a pleasure instead of a dread job as it used to be. If new supers are painted with hot paraffin on the bottom of the section holders or all over, it does away with a lot of work at cleaning time. Rudolf Miller.

Fernley, Nev.

* * *

When to Put Bees Into Cellar. Wintering has not proved to be much of a problem, as I have a good cellar underneath the house. The worst thing to determine is when the bees have had their last flight, as after that they are ready to go into the cellar. I have guessed wrong on the last flight more than once, but last year I decided to wait and give them just one more chance. After the supposed last one which occurred in November, there were a few days during the week when the bees did not venture out. But the following Sunday was bright and sunny, and the little fellows were out by the score enjoying the warm rays. Oh, how I loved to see that last flight! And it was the last one, for a few days later there was something in the air, that spoke to my ears for the first time since the warm season. So the bees went into the cellar and came in just at the right time, it seems, for there was no flying weather afterwards. A. G. Sylvester.

Cokato, Minn.

* * *

Removing Pollen From Combs. In one of my articles published recently in Gleanings the practice of rendering into wax all combs clogged with pollen was described. E. M. Cole of Audubon, Iowa, immediately wrote me describing the following method of saving such combs:

"Using a hive-tool, I scrape the pollen-filled cells down well into the pollen, taking care not to injure the base of the cells. With dry brittle comb, the cells may be broken down until most of the pollen can be shaken out. A minute or two is all the time it takes, and I have had a comb of gummy pollen cleaned out and pretty well drawn in 24 hours. I believe they dig out the pollen because they cannot repair the cells until they do."

I told Mr. Cole we would test this method and report results. We tested it on something like 30 combs. After scraping down the pollen as described, we placed one or two such combs in the middle of each brood-nest needing space for the queen, right in the height of the season. On the next round nearly every one was filled with eggs or young brood, the queen having accepted them, if anything, better than she would empty combs. This little "kink" should be of great value to beekeepers, who are sometimes "blessed" with an oversupply of pollen. The time factor is less than that required for rendering into wax.

Georgetown, Ont. Morley Pettit.

* * *

The Difference in Yield of Honey. I gave a hive with starters, one inch, to a swarm with a virgin queen on August 8. The morning of August 9 I placed them on the scales. In the evening of that day they weighed five pounds more than in the morning, but during the night they reduced it one pound. The next day they gained five and a quarter pounds and reduced it at night three-quarters pound and the next day five and a quarter pounds with one pound reduction at night. I kept this up until the comb was fully drawn when I placed a super of drawn combs on the hive and the same experiment was continued, but the weights ran from ten pounds to twelve and a half pounds per day, with one and a half pounds to two pounds reduction at night. Myron Pickering.

Crane, Mont.

JUST NEWS

Editors

THE new Italian 10-centime copper coin has on one side an embossed figure of a worker bee sipping nectar from a flower. We are indebted to Dr. Alberico Molinari, Terre Del Greco, Italy, for two of these beautiful coins, which indicate the appreciation of the Italian Government—appreciation of the worth of the honeybee.

* * *

Geo. W. Dial, formerly with the A. I. Root Co., has taken active charge as manager of the Michigan Honey Producers' Exchange. His address is 7739 Linwood Street, Detroit, Mich.

* * *

C. A. Hatch of Richland Center, Wis., well known among beekeepers as the inventor of the Hatch wax press and a former contributor to this journal, died on Sept. 19, at his home in Wisconsin.

* * *

The Canadian Horticulturist and Beekeeper was changed to The Beekeeper on Sept. 1, and is now devoted solely to the interest of beekeepers. It will be published at Petersboro, Ontario, as heretofore.

* * *

The annual convention of the Chicago Northwestern Beekeepers' Association will be held in Room 1811, Hotel La Salle, Chicago, Dec. 5 and 6, 1921. Write to John C. Bull, Valparaiso, Ind., secretary, for a program.

* * *

The annual meeting of the Michigan State Beekeepers' Ass'n. will be held in Lansing on December 1 and 2. A good program is promised. Among the notables to appear will be a representative of the American Honey Producers' League.

* * *

The Montgomery County (Ohio) Beekeepers' Association is planning to hold its next meeting at the grave of L. L. Langstroth in Woodland Cemetery, Dayton, Ohio, on Nov. 5. Mrs. Anna L. Cowan, daughter of Langstroth, is expected to be present at this meeting.

* * *

The Western New York Honey Producers' Association will hold its annual fall meeting at the Genesee Hotel, Buffalo, N. Y., on Tuesday, Nov. 15. A good program has been arranged and all beekeepers are invited to attend. J. Roy Lincoln, Pembroke, N. Y., is secretary of this association.

* * *

Professor F. Eric Millen, Provincial Apiarist of Ontario, has just recently returned from England, where he spent a part of his summer vacation. While in England he spoke at several beekeepers' meetings, describing the methods in honey production in Canada and the United States. His lectures were greatly appreciated by British beekeepers.

* * *

The Domestic Beekeeper, which was formerly the Beekeepers' Review, has gone back to the old name given by its founder, W. Z. Hutchinson, in 1888. The arrival of the September issue, with the familiar title, "The Beekeepers' Review," seems like the return of an old friend.

* * *

The Ontario Beekeepers' Association are holding their annual convention on Tuesday, Wednesday, and Thursday, Nov. 22, 23, and 24, in Toronto. The convention will be held at the same time as the Royal Winter Fair. An excellent program is in the course of construction, and the Hon. Manning Doherty will address the beekeepers on "Marketing." Other prominent speakers are expected to be present. Full particulars may be obtained from the secretary, F. Eric Millen, Apicultural Department, O. A. C., Guelph, Ont.

* * *

The Crop Report Committee of the Ontario Beekeepers' Association met in Toronto on Tuesday, Sept. 27, to consider the Dark Honey Crop Reports. Three hundred and twenty-nine reports were received in time for the committee's meeting. The total dark honey reported was 395,445 pounds from 16,817 colonies, an average of 24 pounds. The committee recommends 9 to 11 cents wholesale as the price for dark buckwheat extracted honey. The reports showed that the light honey has moved freely at the prices recommended by the Association Crop Report Committee.

* * *

Definite announcements have been made of a circuit of short courses in beekeeping in which Dr. E. F. Phillips of the Bureau of Entomology, Washington, D. C., and Geo. S. Demuth, Editor of Gleanings in Bee Culture, will take part. The first of these will be held at Fort Collins, Colo., during the week beginning Nov. 21; the second at Grand Junction, Colo., during the week beginning Nov. 28; the third at Los Angeles, Cal., during the week of Dec. 5; and the fourth at Berkeley, Cal., during the week beginning Dec. 12. Frank Rauchfuss, Wesley Foster, and Kennith Hawkins are among the speakers announced for the two short courses in Colorado; and J. D. Bixby, Geo. A. Coleman, Willis Lynch, Fred Hanson, and Cary W. Hartman for the California short courses. Full particulars may be had concerning these short courses by writing to the Colorado College of Agriculture at Fort Collins and the University of California at Berkeley.

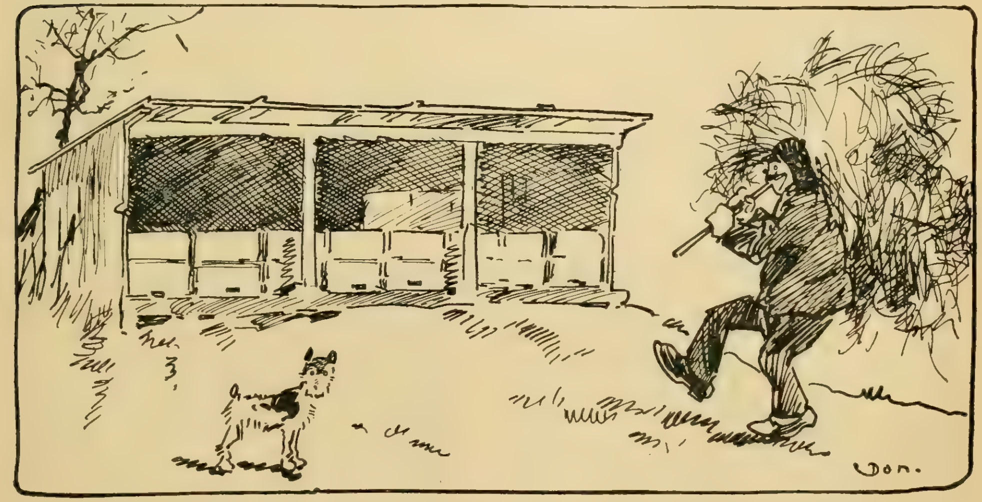
* * *

The Alabama Beekeepers' Association held its annual convention at Montgomery, Ala., on Sept. 22. The meeting was large and enthusiastic. The danger of foul brood getting into the State and the need of foul-brood legislation were laid before the members. At a later meeting, held at Bay Minette, Sept. 28, a committee consisting of the executive officers of the association was appointed to see what could be done toward getting emergency legislation at a special session of the legislature, to be held soon. More bees and queens are reared within 150 miles of Montgomery than any other equal section of the United States. It was, therefore, deemed important that Alabama have a good foul-brood law.

On Oct. 7 there was held at Gainesville, Fla., the second annual meet of the Florida State Beekeepers' Association. This was an enthusiastic gathering called for the purpose of determining how beekeepers might co-operate among themselves in disposing of their honey. Pres. J. W. Barney, in an enthusiastic address, explained how it is possible for the beekeepers of Florida to convert some of their low-grade honeys that are having slow sale into bees and queens, for which there is an active demand. Florida, he said, would have the advantage of Alabama and other States further north by at least from two to three weeks in early delivery. A committee was appointed to see what could be done in formulating plans for furnishing bees to the northern market in March and early April. This association has the active support of Dean Wilmon Newell of the Agricultural College at Gainesville.

When Bees are Packed for Winter.--By Bill Mellvir

(With apologies to Walt Mason.)



When the bees are packed for winter and the honey crop is sold, and the leaves begin to rattle, and the wind is getting cold, and the mornings crisp and frosty when a fellow leaves the hay, and the sun each day is lower, sending just a slanting ray, then I feel quite young and coltish since the season's work is done. Tho I've toiled and sweat and worried, I have had a lot of fun. And it's great to be a-living on a morning crisp and cold when the bees are packed for winter and the honey crop is sold. Say, this world sure is a dinger with its buoyant atmosphere, when the heat of summer's over and the bracing fall is here. So on frisky legs I'm prancing as I chant this lusty rhyme, for a voter should be happy when his work is done on time. Sure I'll miss the daily troubles and the humming of the bees; miss the big extractor's whirring and the little motor's wheeze. But I'm fit as any fiddle as my aching arms I fold when the bees are packed for winter and the honey crop is sold. Foolish ginks will put off packing, till the snow and ice are here. Some will let it go all winter, paying for it mighty dear. Spring will bring great disappointment to the rusty shiftless jay who neglects such simple duties, loitering from day to day. Black remorse for things neglected, can not bring dead bees to life that have burned their lives out early in the deadly winter strife. I've insured my bees 'gainst freezing, and a policy I hold when the bees are packed for winter and the honey crop is sold.

GLEANED BY ASKING

Geo. S. Demuth

QUESTION.—Will a pound of dry sugar fed as syrup make more or less than a pound of sealed stores if none of it is used in comb-building? How much more or less?
Indiana. John Longaker.

Answer.—Much depends upon the time the feeding is done, as well as upon the manner in which it is done. If it is done before brood-rearing ceases, it may stimulate additional brood-rearing, thus causing the bees to use a large portion of the syrup in feeding the additional brood. This is especially the case if the syrup is fed slowly or a little at a time, or if it is made quite thin so the bees are compelled to ripen it. Under such conditions the bees sometimes consume half or more of the syrup as it is fed.

On the other hand, in feeding for winter, if the feeding is postponed until after brood-rearing has ceased and at the time the bees naturally begin to carry honey from the more remote parts of the hive and store it in the empty cells where it will be within the cluster, loss in feeding will be slight, especially if a thick syrup is given while still hot and the feeding is done in such a manner that it is all taken down and stored within a few hours. By taking advantage of the natural instinct of the bees to transport thick stores to the inner portion of the winter nest after the brood has emerged, the bees do not waste much of their energy and food.

In practice, it will be well to count on as many pounds gain in weight of stores when a heavy syrup is fed (not less than two parts of sugar to one part of water) as there are pounds of dry sugar, but when the feeding is done as indicated each pound of dry sugar will result in more than a pound of stores. Just how much more will depend upon how rapidly the bees store it. If the hives are packed when the feeding is done, and the packing is placed around the feeders to keep the syrup warm, there will be but little loss in weight resulting from the bees handling the syrup.

FOOD VALUE OF HONEY.

Question.—What is the amount of calories in one pound of honey in the comb? What in extracted? What about the vitamines in each?
West Virginia. T. K. Massie.

Answer.—The energy value of honey is usually given as 1485 calories per pound. This figure is for extracted honey. The number of calories in a pound of comb honey would be slightly less since the weight of the wax must first be deducted, the wax not being digestible. Experiments conducted by Philip B. Hawk, Jefferson Medical College, indicate the presence of distinct amounts of vitamines in comb honey, especially the fat soluble vitamine. In these experiments the animals which were being fed, grew about as well on comb honey as when 5 per cent of butter was added to their diet. Butter is known to be rich in the fat soluble vitamine.

WHAT IS NOSEMA APIS?

Question.—Will you please state in detail just what *Nosema Apis* is? Ralph Gaston.
Pennsylvania.

Answer.—*Nosema Apis* is the name applied by Zander (1909) to a parasite sometimes found in the walls of the stomach of the honeybee. The disease brought about by this infection is called *Nosema* disease. This disease of adult bees is not considered a particularly serious disorder in this country where it is widely distributed and often found in colonies which appear to be healthy. In 1912 and 1913 Graham Smith and others put forward *Nosema Apis* as the cause of the Isle of Wight disease, but in 1919 Anderson and Rennie and Rennie and Harvey succeeded in establishing that *Nosema* infection is not found in Isle of Wight disease but is the cause of a distinct malady. A similar conclusion had been drawn by Dr. White in this country in 1918.

TEMPERATURE OF HONEY FOR BOTTLING.

Question.—When heating honey for bottling should the water in the tank which surrounds the vessel containing the honey be permitted to boil?
New York. William Dermody.

Answer.—No. The water should not be above 180°F. If it is permitted to boil there is great danger of scorching the honey. The honey itself should not be heated above 160°F. and should not be held at this temperature long, for the flavor of some types of honey will be injured even at 160° F. if kept hot too long.

MOVING BEES FROM NEIGHBORING FARM.

Question.—What is your advice about moving and wintering the bees in box hives which I have recently purchased? They are about a quarter of a mile from my place. S. W. Martin.
Missouri.

Answer.—It will be better to wait until the bees have been confined to their hives for some time by cold weather before moving them, for, if they are moved such a short distance when they are flying freely every few days, many of the bees will go back to their old location. Even when moved after they have been confined to their hives for three or four weeks, many of the bees will go back unless some precautions are taken to prevent it. This can be reduced somewhat by leaning a board against the front of the hives, before the bees take their first flight after being moved, to cause the bees to stop and look back as they leave the hive so they will notice the change in the surroundings. If it is necessary to move the bees before cold weather, you can prevent their going back by first moving them to a new location three or four miles away entirely outside of their present range of flight, leaving them there a week or two and then taking them to your place. In the meantime the bees will have forgotten their old home and will stay where you put them. They should be left in the box hives during the winter to be transferred next spring. Transferring is more easily accomplished in the spring, and, no doubt, the bees will winter better if left in the box hives until that time. They should be protected during the winter from strong winds, and for best wintering the hives should be packed as described in this journal last month.

VENTILATION AND THE SIZE OF BEE CELLAR.

Question.—Will five colonies of bees winter in a cellar 8 feet by 4 feet and 5½ feet deep when snowed under all winter and without provision for extra ventilation? Harold Hanson.
Minnesota.

Answer.—Your little cellar is plenty large enough for five colonies. In fact, you could winter 15 or 20 colonies in a cellar of this size without danger from overcrowding. Usually two square feet of floor surface for each colony is considered ample space for safe cellar wintering if other conditions are favorable. The fact that the cellar is covered over with snow all winter may be an advantage, for it would help keep up the temperature required for good wintering. You do not say whether the cellar is in a loose sandy soil that would permit considerable ventilation thru the soil if the walls are porous, or whether it is in a heavy clay soil. If in a sandy soil you will, no doubt, find that no extra ventilation is necessary. Bees, when wintering well, require but little air because they are quiet, but, if on account of poor food or too low a temperature they become more active, they will of course need more air. It will be well for you to provide a ventilating shaft, which can be closed during the coldest weather if the temperature tends to drop too low with the ventilator open.

HOW EUROPEAN FOUL BROOD IS CARRIED OVER WINTER.

Question.—I have two colonies of Italians that have a few cells of European foul brood. If I unite them and clean up the hive will they get the disease again next spring? If the disease is not in the honey how can it be carried over winter when there is no brood? C. H. J. Baumbach.
Wisconsin.

Answer.—The disease may appear again next spring, especially if the colony should become weak during the winter or early spring. The fact that no diseased larvae can be found in the fall or at any time when the colonies are very strong, does not necessarily mean that the colony is completely rid of it, for some of the virus may still be lurking in the combs. On the other hand, the colony may be entirely free from the disease next spring.

Experiments conducted by Doctor White, in inoculating colonies with European foul brood, show that if *Bacillus Pluton* (the organism which causes the disease) is present in honey extracted from diseased colonies it will be destroyed within a few months while in storage. Apparently there is but little if any danger of the disease being carried over winter in the honey. In pollen, however, it remains virulent much longer, in some cases more than 10 months. When dry within the hive, as in a film on the walls of the cells not perfectly cleaned, it would probably remain alive for more than a year, so there is plenty of opportunity for the disease to be carried over winter while there is no brood, even tho no evidence of disease can be seen in the combs. Whether the disease will appear again next spring, therefore, depends largely upon the thoroness with which the bees clean out the brood-combs. Strong colonies of Italians usually do a more thoro job of cleaning out the cells, which explains how they rid themselves of European foul brood. While *Bacillus Pluton* can remain alive for a long time in a dried film within the hive, if exposed to direct sunlight it will be destroyed within a few hours, so the fragments of the diseased larvae that are carried outside the hive would not be dangerous to other colonies after a few hours' exposure to the sun.

It should be remembered that European foul brood is quite different from American foul brood in its resistance. American foul brood is caused by a spore-forming organism (*Bacillus larvae*), the spores being highly resistant, remaining virulent in the dried-down scales for years and in honey for long periods of time.

BEEKEEPING WHERE AMERICAN FOUL BROOD IS PREVALENT.

Question.—Would it be of any use for me to try to keep more colonies of bees when American foul brood is about? John Bieseman.
Ohio.

Answer.—You can continue to keep bees in spite of American foul brood in your vicinity just as you continue to keep them in spite of the winters or swarming or any of the many other things that trouble us. Usually only a small percentage of the colonies will contract this disease each season, and by watching for it in its early stages, whenever the colonies are examined, the disease can be detected before it does much damage to the colony. By visiting neighboring beekeepers and showing them how to detect and treat the disease, if they do not already know, the amount of disease in a community can be so reduced that only an occasional case should appear. Such co-operation among beekeepers is, of course, more difficult in towns and cities on account of the difficulty in finding all of one's beekeeping neighbors. Many extensive honey producers are securing good crops of honey year after year in localities where American foul brood is present, and would no more think of giving up beekeeping on account of disease in their neighbors' colonies than the farmer would think of giving up farming on account of the weeds on neighboring farms.

The Dr. C. C. Miller Memorial Fund

An Appeal to Beekeepers Everywhere to Have a Part in Establishing the Miller Library of Beekeeping.

DR. C. C. MILLER

Receipts of contributions for this Fund have been made in the bee journals, and the thanks of the committee which has the fund in charge are extended to each contributor. These thanks are extended in behalf of the thousands of friends of Doctor Miller everywhere, who are anxious that this memorial shall be worthy of the man.

As is well known, the undersigned committee was chosen by C. P. Dadant to act informally in collecting and expending the money to be contributed by the many friends of Doctor Miller. At the time of the first announcements it was quite impossible to tell what form the memorial should take, and as a result the whole matter was presented in quite an indefinite way. Suggestions were made to the committee of various forms in which the memorial could be established. Some desired a monument to be erected at his grave; but this was quite disapproved by most of those with whom we could talk, because it did not seem fitting that Doctor Miller's memory should be perpetuated in such a manner.

Following out the widely approved idea that this fund should be put to work for the benefit of beekeeping for all time, which is the type of memorial that fits the character of our esteemed friend, the most feasible suggestion seems to be to establish a library in which may be collected the books, journals, and reprints of scientific articles on bees and beekeeping, available to those who desire to make special studies in this field. Such a memorial will be less widely available than we would wish, but it follows out the ideas of the many friends who are interested in the fund better than any other that has come to us. This then is what we shall work for.

The location of the library is, of course, still undecided, and the method of management and the safeguarding of the funds for the future are matters which can be determined only after we are able to know how much will be available, but in any event we hope to establish a fund which shall be permanently invested so that the interest shall be used for the furtherance of this library.

For the funds available we know of no more important endowment than this one, for there is today no library in the United States that approaches completeness in this field. There are several excellent private libraries on beekeeping and also several growing institutional libraries of great value, but we hope as the years go by that the Miller Library of Beekeeping will surpass any of them. We also hope that contributions of valuable books and pamphlets will be made so that this Library will grow rapidly.

With this definite plan we make another appeal to the beekeeping friends of the late Doctor Miller to contribute still more liberally than they have to this fund. Many are able to increase their contributions and a still larger number who have not contributed will now, we feel, be anxious to help in this worthy cause. In contributing to a lasting memorial of this kind we not only honor the memory of a great friend but we help in the furtherance of the industry in which we are all so greatly interested. Contributions may be sent to the editors of The American Bee Journal and Gleanings in Bee Culture, and will be acknowledged thru these journals. May we not ask for greater liberality now that we are able to announce a more definite plan, and may we not all unite in making this a project in which all beekeepers thruout the world may take just pride?

We would also ask that at the meetings of beekeepers for the next few months this project be brought to the attention of those in attendance so that they may have an opportunity to make contributions. Several beekeepers' associations have already taken such action, and in this way liberal contributions have been made. We ask for the hearty co-operation of each and every beekeeper in this movement and want each one to feel that this is not merely an effort being made by a committee but that it is a project dear to the heart of every beekeeper everywhere.

C. P. Dadant,
E. R. Root,
E. F. Phillips,
E. G. LeStourgeon,
B. F. Kindig.

OUR HOMES

A. I. ROOT

Whatsoever thy hand findeth to do, do it with thy might.—Ecc. 9:10.

In the sweat of thy face shalt thou eat bread.—GEN. 3:19.

I have been young, and now am old; yet have I not seen the righteous forsaken nor his seed begging bread.—PSALM 37:25.

WHILE I write we are told there are some over five millions of unemployed people in our land. I think one statement made it seven millions. I do not know whether the statement was intended to apply to men only, but I have not seen anything in regard to the ''great army'' of unemployed *girls* and *women*. Here in Medina Mrs. Root finds it a difficult matter to find a woman, young or old, who is willing to come and do washing. She usually has a very good woman who comes quite regularly once in two weeks; but as she is the mother of *five children*, it is sometimes inconvenient for her to come for only about two hours, and at such times there does not seem to be anybody to take her place. Down in our Florida home she did finally get a colored woman to clean house; but her bill for seven hours' work was $3.50—just *twice* what I paid Wesley for work in the garden.

About 35 years ago, when there was considerable talk about the ''great army of unemployed,'' I wrote a book entitled ''What to Do, and How to Be Happy While Doing It.'' I think we printed about 10,000 copies, and they have all been sold with the exception of about two dozen. I hope they are still doing good. In that book I tried to point out something for idle men or idle women to do. It was mostly along the line of making garden, keeping chickens, etc. After reading a part of the book today, I still think my instructions were sound. If the man who is out of work has a little place of his own (as every man with a family should have), let him go to work making garden or fixing up that little home. When the people around him can see that he is both busy and industrious, and skillful as well (especially the latter), somebody will have something for him to do. I am scanning the dailies now every day to see what our Government is doing to find work for the unemployed, and I am pleased to note that making better roads has been suggested. After the trip that Ernest and I made a year ago from Ohio to Florida, we certainly are prepared to appreciate *good hard roads*. I now enjoy riding over such a road, in a way I never could have done had it not been for that trip; and it is a part of everyday prayer (or *almost* every day), that God will bless the efforts that are being made to make it easier for the farmers to get the product of their toil up nearer the consumer. Nothing is more needed just now than short cuts along that line. Good roads will help it more than almost anything else.

On page 582 of our September issue is something about what I discovered years ago; and that is, womankind *can* do almost any kind of work that men can do; and not only that, in a good many cases, they do it even better. When the war took the men away, our factories and great offices discovered that women and girls, especially the stenographers, could get along very well in the absence of the men. Now that the war is over these good women have been a little reluctant to give up their places in the great business world; and my impression is that many of the *employers* have been reluctant about asking them to step ''down and out.'' This is *one* reason for those five millions of workmen being unemployed.

Just one more thing while I am about it: The girls and women do not use cigarettes, nor tobacco in any form. They are more tidy in their habits; they take better care of their surroundings; they do not fill the room with smoke; they do not gossip (I am not overstating this matter, am I?); they do not tell filthy stories; and last, but by no means least, they are not absent from business on Monday morning on account of having been out on a spree the day before.

As you know, there are various organizations just now up in front in regard to doing something for the unemployed. I think our good President Harding has been conspicuous in the movement. Investigation has been made as to the reasons *why* these men could not get a job. I have not at hand the result of these investigations; but I think the greater part of these unemployed men are not skilled workmen. They are not even day laborers, accustomed to good strong muscular work. I remember hearing of one man, who seemed to be a fair sample, when interviewed and offered a job, before accepting it, said he wanted to know what he was to do, what pay he would get, and how many hours were to be considered a day's work. As you doubtless all know, I have been employing people more or less all my life. I think the statement was once made by some periodical that I never did a day's work in my life, for anybody else. This statement, however, was a little overdrawn. I remember distinctly riding a horse in my boyhood, to cultivate corn for 25 cents a day. As a natural consequence, during all these years men, women, girls, and boys have been coming to me wanting a job. Some good men who now stand away up in some of our great cities once worked for me, when they were little kids, for five cents an hour, and one or two for even three cents an hour. We have had many a laugh over it. Sometimes an applicant has said to me in substance, ''Mr. Root, if you will show me what you want done I will do the best I can, and *you* may decide what you can afford to pay.'' My son-in-law, J. T. Calvert, worked in our apiary in just that way, and for a time, he got a raise almost every week until he finally became general manager for the *entire A. I. Root Company.* I have tried all along these years starting tramps at work who claimed that they could not get a job; but the greater part of them, I soon discovered, were not very anxious to get a job at fair wages. By the way, it just now occurs to me what a tremendous difference there is in humanity in this matter of finding something to do. Just think of it! a full-grown man with average intellect unemployed because there seems to be no chance to do honest work, and at the same time, right near, perhaps in his next-door neighbor we find a man like Ford who employs men by the thousands, paying them unheard-of wages, and at the same time is a blessing to the whole world in this matter of transportation. Our doing away with intoxicants and opiates is certainly going to be a great help.

I have not touched on the matter of strikes in the above; but while I agree that it is certainly right and proper for workingmen to have some sort of union, it certainly is neither right nor Christianlike for any man, who sees fit to refuse the pay offered him, to stand in the way, or to put stumbling blocks in the path, of those who would be glad to do the work and receive the pay that he has declined to accept.

THE HIGH COST OF LIVING, THE HIGH COST OF GETTING SICK, AND THE HIGH COST OF DYING.

Something About a Still Shorter Cut Between Producer and Consumer.

Mrs. Root and I lately stepped into a Medina grocery. After making our purchases we both noticed a very attractive package on top of a glass showcase, labeled ''Graham Crackers.'' Now, I am great on everything graham; but I want the pure wheat—not any sugar nor anything else. I think this attractive package read something like this: ''Ninety-nine per cent pure wheat.'' I asked the grocer if they were sweetened. He said they were not, and so we took the package. When we reached home I also read, ''6½ ounces net.'' The price was 20 cents. You can readily figure that we paid about 50 cents a pound for our graham crackers, where the real wheat (''99 per cent pure'') brings the farmer, just now, less than *3 cents* a pound. How is that for economy in the household, or to reduce the high cost of living? The producer gets less than 3 cents, and the consumer pays close to 50 cents a pound.

Yes, I have had this matter up before; but, God helping me, I am going to keep bringing it up for several years yet. The graham crackers are not alone; almost everything you buy at the grocery, especially if it is put up in small attractive packages, is a good deal in the line of that little package. You pay for the pasteboard, you pay for expensive printing, you pay for handling; and if you will go into the groceries and investigate, as to almost everything put up in packages, you will find the same result.

Down in Florida last winter the only oyster crackers we could get were 30 cents a pound in bulk. If you bought Uneeda biscuits or any other kind of crackers *in packages* the price was more than 30 cents a pound. Later the crackers came down to 25 cents, and I do not know but one store made a specialty of some kind of crackers in bulk for only 20 cents. I sent to Sears, Roebuck & Co. for a 12-pound box of very nice crackers, and they cost only *14 cents* a pound; but the freight was so much, even with a lot of other stuff, that it was not much of a saving after all. Today (Oct. 5) at a ''cash and carry'' grocery, right across the railroad tracks from our factories, very nice oyster crackers are only 14c per pound.

Now, where is the remedy? I do not propose to make a kick against our grocers or anybody else unless I have something to offer in the way of a remedy. Grind your wheat in your own home in a coffee-mill. If there are not ''kids'' enough in your family, either boys or girls, to turn the mill, have it done by means of an electric motor or a little cheap gasoline engine. By the way, you will not need any more ingredients to make a most wholesome and appetizing substitute for either bread or crackers. You *can* boil the wheat *whole* until it cracks open; but this takes a lot of time and considerable fuel, and therefore it is a saving all around to grind the wheat. Just crack it and it will cook very much quicker. ''Cracked wheat'' has been so much talked about for years past that I do not need to elaborate.

I have been having quite a lot of automobile rides lately thru the country, and I have kept saying ''thank the Lord'' mentally, even if I did not say it out loud. Do you know why? Well, just of late we have been enjoying a beautiful macadam road between Medina and Cleveland. No matter what the weather is, my little electric auto spins like a top up hill and down. Well, since this good road was finished there is an almost constant stream of automobiles to and fro; and the farmers who have apples or peaches or anything else to sell, have their produce in neat and attractive packages on a little stand placed on a pretty piece of green lawn close to that beautiful highway, with prices in plain print. If no one is in sight, just toot the automobile horn, or whatever it is, and somebody will wait on you. Mell Pritchard's son is selling honey in the same way, and just lately he has been putting up some little boards on top of a stake, maybe a yard high, with just the one word on it—"HONEY." These little signs are strung along the highway for a mile or more in each direction. One objection that has already been made is that there are more automobiles passing on Sunday than on any other day; and a great part of the Sunday people would like to buy stuff on Sunday as well as week days. I hardly need tell you that I object to anything on Sunday that calls for money back and forth, unless it is a restaurant for regular meals. One of these signs near the city of Cleveland has a notice in plain black letters, "No sales on Sunday."

Last winter, when Huber and I ran over a considerable part of Florida, we found oranges and other fruit in attractive baskets, more or less all along the improved highways. Here is another argument for good roads. Just think and consider, and not only consider but *act*, dear friends. Instead of paying fifty cents for what need not cost over three cents, help the world by example and precept in making a *still shorter* cut between producer and consumer. Stop buying stuff in little fancy packages. When you are taking an outing in an automobile, and wish to have a picnic supper or dinner, 20 cents for a few crackers with some fruit and cheese to go with it may be all right, as it saves time. But when you undertake to keep a family and buy your food in little packages as I have indicated, just remember what your old friend A. I. Root has said about it.

I wonder if somebody will not rise up right here and say, "Mr. Root, what about Airline honey," My reply is, do the same way, by all means, in regard to honey. Hunt up the beekeeper, and, instead of asking him to put it up in little tumblers, buy a five-gallon can or if you do not want to buy so much, say a ten-pound can. Honey, for safety, must be put up in expensive glass or tins, and these are heavy to ship. Honey should *not* be sent long distances. There ought to be a beekeeper within, say, ten miles of every home, and you can take your automobile and go and get it. If you persist in going to the groceries and buying it a tumblerful at a time, let me be frank and tell you what you will have to do. I do not propose to screen myself nor our industry here at Medina. You know, perhaps, we buy honey by the carload, and a good many times these carloads come from away off in California or some other great distance. We have just received a carload of mesquite honey from Arizona. We paid the beekeeper 6½ cents a pound for it; but we had to pay the expensive freight all the way from Arizona. Then in order to give the proper blend and color we had to put in some better and whiter honey with it—usually our northern white clover honey—to bring it up to grade and quality as well as color. Then this honey is sometimes shipped as far as the carload was shipped in the first place from Arizona. When it gets into the grocery, far away from Medina, I should not wonder if the grocer finds that 75 cents for a 3-lb. can or jar is the best he can do.

I have been telling you repeatedly in my Home papers that I started out almost 50 years ago to put the serving of humanity *first*, as my object in life, and serving A. I. Root, in the second place.

Just a word more about your grocer. Please do not think that I am putting the blame all on him. The grocer, as a rule, furnishes what his customer calls for. Mrs. Root and I have just used up a package of oatmeal. I figured up that it cost us 12 cents a pound in a fancy package. I said to our grocer, "Have you oatmeal in bulk?"

"Sure," he replied.

"How much a pound is it?"

"Six cents."

There you have it. A great part of our daily food is kept by the grocer in bulk as well as in fancy packages; and in fancy packages it costs twice as much, or even more than that, and yet the people pay the big price just on account of *looks*, while at this very time they are starving by the millions, not only in China but away off in poor Russia. Let me go over it briefly again.

Wheat ground in the coffee-mill costs you 3 cents a pound or less; made into crackers and put up in fancy packages it costs 50 cents a pound. Perhaps the graham crackers are an extreme; but there are a great many other things in the same line. And a sadder thing on top of all of it is that a lot of people—yes very likely you and I—are "digging our graves with our teeth" by eating *more* than is *good* for us, with little or no thought of the starving millions.

Good friends, if you will look at my heading you will see it includes something about the cost of getting sick. I told you a year ago about the examination they gave me at Battle Creek. Well, the dear children (grandchildren and all, as well as myself) think it best that I should be examined at least once a year by a competent physician. In the great city of Cleveland there are, of course, a great many doctors—yes, and a great lot of "high-priced" doctors. Just a little while ago I heard of one Cleveland doctor who does not use any medicine at all. And he does not send one to any drugstore to pay out ever so many dollars for "prescriptions." If I remember correctly some of the drugstores have been accused of charging *almost* as big profits (?) as that graham-cracker episode—50 cents for 3 cents' worth of wheat.

A good friend of mine went to a prominent physician, and this doctor gave him a prescription to be filled out at the drugstore; and he said, in referring to it in a joking way, "There was enough medicine to *kill* a horse if he had taken it all."

Well, this Cleveland doctor, when he caught sight of me, began to laugh. By the way, in years gone by he was one of my Sunday-school pupils. He said something like this:

"Mr. Root, some thirty or more years ago you recommended pretty vehemently a hot-water enema in place of pills and physics. Later on you told us that you made a mistake in advising the use of it every day, saying that it should be used only occasionally when there are indications that the bowels do not have the thoro cleansing which they should have. The leading physicians of the great wide world are just now pretty unanimously getting around to your teachings of years ago. *Pills* and *physics* are to be a thing of the past."

First he congratulated me on being in such excellent shape for a man of 82; and then, touching my forehead, he added, "Especially in being able to give the world these Home papers apparently about as well as you ever did when 60 years old instead of 82." He said my troubles which sent me to him were probably caused by tardy or imperfect bowel movement; that the same cracked wheat that I have been talking to you about was the very best remedy—much better than bran put up in fancy packages or anything else of that sort. Then there is one more important thing. All machinery, when it becomes old, must have a lubricant, and more and a better lubricant. He said that old men and women are just like machinery. Years ago Dr. Salisbury said to me the human body needs to be kept "well greased;" and I think he recommended castor oil. Dr. Bishop said that butter, bacon, and animal fats of all kind are well enough for lubricating, but that old people in particular need a lubricant that is neither *animal* nor *vegetable*. He said we are just now getting hold of a *mineral* lubricant made from crude oil. I think you can get this at any drugstore, made specially for medicine. He said, "At first take, at night, a tablespoonful or more; but after a thoro cleansing movement has been secured take a little occasionally as needed."

A good rule is to take enough so that the toilet papers will look a little greasy. He added further that my outdoor exercise was the thing; and going to Florida winters in order to have this outdoor exercise was also the *right* thing. In regard to diet, he said that men and women over 80 years of age should be fed about as we feed a baby. Fruit is all right; but, as a rule, it should be well cooked; and last, but by no means least, old people should sleep about as often as a baby sleeps—say a good nap shortly after every meal; and that is just about what I have been having. Have meals regularly; let there be no eating of any thing of any sort between meals; and have the sleep, as far as possible, at regular hours, not only to the hour, but, if possible, almost to the minute.

I was intending to say something about the high cost of dying; but this paper is already too long. Mrs. Root suggests that the very cheapest coffins you can get here in Medina cost $100. These coffins are never exposed to public gaze for more than a few hours. I would suggest a plain wooden box made of the cheapest kind of material. To hide its unsightliness during the brief time it is exposed to view, cover it with some cheap paper, and take the money thus saved to feed the starving babies and poor mothers who seem to be dying from lack of nourishment in some parts of this world of ours almost every day and every hour. Use some of the money thus saved for putting up a decent tombstone which can be visited by the descendants for years to come, and have some appropriate lettering as a reminder of the life of the departed one; and also do your part in keeping the cemetery in decent-looking order. Some one has said that the best indication of the way in which a town or city is managed and kept up to date is shown by the appearance of the cemetery.

HUBAM CLOVER AND WHAT IT MAY DO AS A FIELD CROP.

By Prof. Hughes (himself)

The extent to which Hubam will come to be used as a field crop will depend largely on the growth which it makes following the small grain crop when seeded with the small grain in the spring. We are trying to get together just now as complete information as we can from all parts of the country on this particular phase of its growth. I had an excellent report this morning from central Wisconsin, where when seeded with barley it had made a growth of over two feet following the removal of barley, and produced a great mass of material for plowing under. This report came from Melvin Haines at Sawyer, Wis. He writes that he is nearly a hundred years old and a retired farmer, and will not be able to use it much himself, but wants to leave something to his friends and neighbors and has great faith in this clover. Altho the writer was a retired farmer, he tells me that he is an extensive grower of cherries, and that they have marketed 350,000 cases of sour cherries this year.

In a letter from my father received yesterday from northern Illinois, he states that the Hubam seeded with the winter wheat made a growth of over four feet following the removal of the winter wheat crop, and that it is still growing rapidly; that it has outgrown ragweed, pigweed, tumbleweed, and everything else, making over eight times the growth of other clovers seeded under the same conditions. Another report, received a few days ago from Iowa, reports a perfect mass of material following winter wheat with a growth of four feet there.

There are, of course, a few individuals here and there who feel it their duty to warn the public that Hubam clover really has no value, and when these occasionally come to our attention, you can imagine how much we appreciate the support of such men as yourself, your son, and Mr. Collingwood and others. Very sincerely yours,

Newbern, Ala., Oct. 4, 1921. H. D. Hughes.

Classified Advertisements

Notices will be inserted in these classified columns for 50c per line. Advertisements intended for this department cannot be less than two lines, and you must say you want your advertisement in the classified column or we will not be responsible for errors. Copy should be received by 15th of preceding month to insure insertion.

REGULAR ADVERTISEMENTS DISCONTINUED IN GOOD STANDING.

(Temporary advertisers and advertisers of small lots, when discontinued, are not here listed. It is only regular advertisers of regular lines who are here listed when their advertisements are discontinued when they are in good standing.)

H. C. Lee, Dr. White Bee Company, Virgil Weaver, C. D. Townsend, T. J. Talley, I. J. Stringham, Robert B. Spicer, F A. Salisbury, F. M. Russell, G. Routzahn, Chas. Reynders, J. P. Moore, J. F. Moore, G. H. Merrill, C. A. Mayeux, J. J. Lewis, F. W. Lesser, E L. Lane, Adam Kalb, Jensen's Apiaries, J. D. Harrah, D. W. Howell, Jos. Hanke, Greenville Bee Co., C. I. Goodrich, J. F. Garretson, Foster Honey & Merc. Co., C. S. Engle, F. R. Davis, R. O. Cox, Mrs. Alice Burrows, Bee-dell Apiaries.

HONEY AND WAX FOR SALE

FOR SALE—Amber honey in 60-lb. cans. P. W. Sowinski, Bellaire, Mich.

FOR SALE—Buckwheat honey in 60-lb. cans. Bert Smith, Romulus, N. Y.

FOR SALE—White and amber honey in 5-lb. pails, packed in cases of 12. R. C. Wittman, St. Marys, Pa.

FOR SALE—A ton of extracted honey suitable for baking purposes. E. D. Townsend & Sons, Northstar, Michigan.

FOR SALE—Clover, basswood, or buckwheat honey, in 5-lb. or 10-lb. pails, or 60-lb. cans. H. B. Gable, Romulus, N. Y.

FOR SALE—Finest clover honey. Packed in new 60-lb. cans and 5-lb. pails. Sample 15c. A. C. Ames, Weston, Ohio.

FOR SALE—Finest quality clover-basswood and buckwheat honey, 5, 10, and 60 lb. tins. H. F. Williams, Romulus, N. Y.

FOR SALE—8000 lbs. choice white clover extracted honey. Sample 20c, applied on first order. C. H. Hodgkin, Rochester, Ohio.

FOR SALE—Extra fine white clover honey in new 60-lb. cans, two to the case, at $15.00, f. o. b. Ruthven, Iowa. Martin Carsmoe.

FOR SALE—New crop buckwheat honey in 60-lb. cans, two to the case. D. L. Woodward, Clarksville, N. Y.

FOR SALE—Choice clover honey in new 60-lb. cans, all produced on new combs. Sample 20c. W. B. Crane, McComb, Ohio.

FOR SALE—White clover honey, almost water white. Put up in new 60-lb. tin cans, two to the case. Write for prices. D. R. Townsend, Northstar, Mich.

FOR SALE—12,000 lbs. of choice white clover honey in 60-lb. cans at 15c per lb., f. o. b. Brooksville, Ky. Sample 25c. W. B. Wallins, Brooksville, Ky.

FOR SALE—Choice clover honey, 15c; buckwheat, 10c per pound. Two 60-lb. cans to case, f. o. b. here. Wm. Vollmer, Akron, N. Y.

FOR SALE—White honey in 60-lb. cans, also West Indian in 50-gal. barrels. Sample and price on request. A. I. Root Co., 23 Leonard St., New York City.

FOR SALE—New crop extracted honey. Put up in new cans and cases. This honey extracted from sealed combs and is of finest quality. Also have comb honey. Gelser Bros., Dalton, N. Y.

FOR SALE—Fine quality light amber honey, over half clover. Put up in 5-lb. pails, packed in barrels. Heated to prevent granulation. Price right. The Scott Apiaries, LaGrange, Ind.

FOR SALE—Amber honey in 60-lb. cans and 160-lb. kegs, at 8c per lb.; 2000 lbs. of clover and basswood honey 1920 crop at reduced prices in 60-lb. cans. Geo. M. Sowarby, Cato, N. Y.

FOR SALE—Extra choice extracted white clover honey, put up in 60-lb. cans and 5-lb. lithographed pails. Sample 20c. Same to apply on first order. E. J. Stahlman, Grover Hill, Ohio.

FOR SALE—Clover, basswood, or buckwheat honey, comb and extracted, by the case, ton, or carload. Let me supply your wants with this fine N. Y. State honey. C. B. Howard, Geneva, N. Y.

FOR SALE—Several thousand pounds of the finest quality clover extracted honey. New cans and cases. None better produced. Howard Townsend, Northstar, Michigan.

FOR SALE—Extra choice extracted white clover honey, put up in new 60-lb. cans and 5-lb. pails. Sample 20c, same to apply on first order. David Running, Filion, Mich.

HONEY FOR SALE—In 60-lb. tins, water-white orange, 14c; water-white clover or white sage, 12c; extra L. A. sage, 11c; N. Y. State buckwheat, 10c, for immediate shipment from New York. Hoffman & Hauck, Inc., Woodhaven, N. Y.

FOR SALE—White honey, 15c a lb.; L. A. alfalfa, 14c, in two 60- lb. cans; Chilian in 165-lb. kegs, 10c; light amber honey in 50-gal. bbls., 80c a gal. Beeswax, 30c a lb. Walter C. Morris, 105 Hudson St., New York City.

FOR SALE—500 cases buckwheat and goldenrod comb honey. Will average 22 lbs. to the case of 24 sections, $4.50 per case, f. o. b. here. For 50 cases or more write for prices. Edgar Williams, Pierpont, Ohio.

FOR SALE—New crop choice clover extracted honey packed in NEW cans and cases at $14.85 per case of two 60-lb. cans. A few cases of last year's clover honey at 10c. Write for price on 10 or more cases of new honey. J. D. Beals, Oto, Iowa.

YOU only have to buy 600 pounds of E. D. Townsend & Sons' fine clover extracted honey to get their very lowest wholesale price this year. If your customers require the best, write them at Northstar, Michigan, for their price.

FOR SALE—No. 1 white comb honey, $6.00 per case; No. 2 white comb, $5.00 per case of 24 sections; six cases to carrier. Clover extracted, two 60-lb. cans to case, 15c a lb.; clover in 5-lb. pails, $1.00 each, 12 pails to case. Amber baking honey in 60-lb. cans, 10c; same in 50-gal. barrels, 8c. H. G. Quirin, Bellevue, Ohio.

RASPBERRY HONEY—Blended with a slight amount of willow-herb honey, two of the best honeys of northern Michigan. It was all thoroly ripened by the bees. It is good thick body, and fine flavor, none better for table use. It is put up for sale in 60-lb. tin cans. Price for two cans in a case, $18.00; for one can in a case, $9.50. Sample by mail, 20c, which may be applied on purchase of honey. Elmer Hutchinson & Son, Lake City, Mich.

FOR SALE—Extra fine well-ripened clover honey in 60-lb. tins, two cans to the case, at $15.50 per case. Adam Bodenschatz, Lemont, Ills.

FOR SALE—20,000 lbs. 1921 crop extracted honey, left on the hives until thoroly ripened. Fine quality white clover, 11c; light amber, 10c; amber, 9c, f. o. b. at Marietta. J. G. Burtis, Marietta, N. Y.

I HAVE about 30,000 lbs. of choice sweet clover honey and to get some cash hurriedly I will sell it at 10c per pound f. o. b. Don't think anything wrong because it is cheap, for it is clear and all sealed on hives before extracting, and put up in second-hand cans that are as good as new on inside. Try it. Joe C. Weaver, Cochrane, Ala.

FOR SALE—Extra fine Michigan white clover and basswood honey. Almost water white. Indeed, I doubt if the color, body, and flavor can be beat. Put up in 60-lb. cans, two to the case, at 15c per pound, or in 5-lb. pails, 50 to the barrel, at 17c per pound. Sample 15c. O. H. Schmidt, R. D. No. 5, Bay City, Mich.

FOR SALE—Several thousand pounds extra well-ripened white clover honey, with a slight admixture of goldenrod honey. Color, clear light golden. Flavor mild and delicious. Put up in new 60-lb. cans, two in a case. Price, per case, $15.00, or 12½c per lb. f. o. b. Merritt. Sample, 15c. Will be applied on order. It pleases my local customers and it will please you. J. H. Corwin, Merritt, Mich.

FOR SALE—A carload of the very finest quality extracted honey. This crop of honey was produced above excluders, in white combs that have never been used for brood; then the entire crop was left upon the hives until some time after the close of the honey flow, so is very thoroly cured by the bees. It is being put into new 60-lb. net tin cans; in fact, not a single thing has been neglected to make this crop of honey the finest possible to produce. It was gathered from white clover principally, with a very little basswood mixed in it, perhaps 5%. Of course, this fine honey is worth more than ordinary honey and we have to ask just a little above market price for it, so those not having a market that will pay a little more for an extra quality honey, had better not write about this year's crop of honey. E. D. Townsend & Sons, Northstar, Michigan.

HONEY AND WAX WANTED.

WANTED—Bulk comb and section honey. J. E. Harris, Morristown, Tenn.

WANTED—Honey, section, bulk comb, and extracted. W. A. Hunter, Terre Haute, Ind.

HONEY WANTED—Give particulars in first letter. Elton Warner, "Beaverdam," Asheville, N. C.

BEESWAX WANTED—For manufacture into SUPERIOR FOUNDATION. (Weed Process.)
Superior Honey Co., Ogden, Utah.

WANTED—Beeswax, also old comb and cappings to render on shares. Will buy your share and pay the highest market price. F. J. Rettig, Wabash, Ind.

I AM in the market for white clover, basswood, or amber honey. Send sample and quote me your lowest prices delivered f. o. b. Preston. M. V. Facey, Preston, Minn.

WANTED—All kinds comb and extracted honey and beeswax. Car lots or less—and full colonies of bees. W. C. Morris, 170 Rossiter Ave., Yonkers, N. Y.

WANTED—Shipments of old combs and cappings for rendering. We pay the highest cash and trade prices, charging but 5c a pound for wax rendered. The Fred W. Muth Co., Pearl and Walnut Sts., Cincinnati, O.

WANTED—Beeswax. We are paying 1 and 2c extra for choice yellow beeswax, and in exchange for supplies we can offer a still better price. Be sure your shipment bears your name and address, so we can identify it immediately upon arrival, and make prompt remittance. The A. I. Root Co., Medina, Ohio.

WE BUY honey and beeswax. Give us your best price delivered in New York. On comb honey, state quantity, quality, size, and weight of sections and number of sections to a case. Extracted honey, quantity, quality, how packed, and send samples. Chas. Israel Bros. Co., 486-490 Canal St., New York City.

FOR SALE

ROOT'S GOODS AT ROOT'S PRICES. A. W. Yates, Hartford, Conn.

HONEY LABELS—New designs. Catalog free. Eastern Label Co., Clintonville, Conn.

FOR SALE—A full line of Root's goods at Root's prices. A. L. Healy, Mayaguez, Porto Rico.

ROOT'S BEE SUPPLIES—For the Central Southwest Beekeepers. Beeswax wanted. Free catalog. Stiles Bee Supply Co., Stillwater, Okla.

FOR SALE—200 10-frame comb supers, painted, good as new, also queen-excluders, etc. J. A. Everett, Edgewater, Colo.

PORTER BEE-ESCAPES save honey, time, and money. Great labor-savers. For sale by all dealers in bee supplies. R. & E. C. Porter, Lewiston, Ill.

FOR SALE — "SUPERIOR" FOUNDATION, "quality unexcelled." Let us prove it. Order now. Superior Honey Co., Ogden, Utah.

FOR SALE—Good second-hand 60-lb. cans, two cans to a case, boxed, at 60c per case f. o. b. Cincinnati. Terms cash. C. H. W. Weber & Co., 2163 Central Ave., Cincinnati, Ohio.

SHIPPING CASES—1000 12-lb. three-row shipping cases, 2-inch glass for 4¼x4¼x1½-inch plain sections. These cases are complete, KD, packed in crates of 50. Price per crate, $12.50. The A. I. Root Co., Medina, Ohio.

SWEET CLOVER hullers and scarifiers combined, hulls and scarifies at the same time. Two screens and an extra set of lining included. Price, $3.50 each, postage extra. S. Rouse, Ludlow, R. D. No. 2, Ky.

WANTS AND EXCHANGES.

WANTED—Will trade queens or pound packages for Barnes saw. V. R. Thagard, Greenville, Ala.

WANTED—A two-frame reversible extractor, at once. State price. Van Collins, Riversville Road, Port Chester, N. Y.

WANTED—Old combs and cappings for rendering on shares. Our steam equipment secures all the wax. Superior Honey Co., Ogden, Utah.

OLD COMBS, cappings, or slumgum wanted for rendering by steam press process. We pay cash for wax rendered, trade for supplies, or work it into foundation. W. T. Falconer Mfg. Co., Falconer, N. Y.

OLD COMBS WANTED—Our steam wax-presses will get every ounce of beeswax out of old combs, cappings, or slumgum. Send for our terms and our 1921 catalog. We will buy your share of the wax for cash or will work it into foundation for you. Dadant & Sons, Hamilton, Illinois.

BEESWAX wanted. Old combs (dry) and cappings for rendering. Also wax accepted in trade. Top market prices offered. A. I. Root Co. of Iowa, Council Bluffs, Iowa.

FOR SALE OR TRADE—30-40 Krag high-power magazine rifle, perfect condition. Want beehives or extractor. Charles Thielman, R. D. No. 2, Powderly, Texas.

MAN and wife, expert beekeepers, going south with Ford car. Want Florida apiary on shares or might buy. Will clean up foul brood if necessary. E. W. Brown, Box 117, Willow Springs, Ill.

WANTED—10-frame standard hives and equipment, empty combs (wired) and bees (nearby). To interest must be warranted disease-free, good condition and priced right. L. W. Smith, Madison, N. J. (or 56 William St., New York City).

SEEDS AND PLANTS.

HUBAM clover seed for sale. Get my prices. J. Tom White, Dublin, Ga.

PURE Hubam or white annual sweet clover seed. Oz., 25c; lb., $2.00. L. B. Harber, Rt. 1, Mt. Olivet, Ky.

HUBAM or annual sweet clover seed (Hughes variety), at reduced prices. Evan Jones, Williamstown, N. J.

BOOKING orders for low bush huckleberry plants. No. 1 extra large blue, No. 2 blue, No. 3 black, at 50c each; $5.00 per doz. Over 12 doz., $4.00 per doz. Fill orders until January. Mrs. S. A. Bradshaw, Luverne, R. D. No. 4, Ala.

BEES AND QUEENS.

FOR SALE—Italian queens, nuclei, and packages. B. F. Kindig, E. Lansing, Mich.

HARDY Italian queens, $1.00 each. W. G. Lauver, Middletown, Pa.

SEE our large advertisement on page 729 for prices. Buckeye Bee Co., Justus, Ohio.

WHEN it's GOLDEN, it's PHELPS. C. W. Phelps & Son, Binghamton, N. Y.

FOR SALE—100 colonies bees in lots to suit buyer. Loveland Honey & Merc. Co., Loveland, Colo.

SEE our large advertisement elsewhere. Rosedale Apiaries, J. B. Marshall and H. P. LeBlanc, Props., Big Bend, La.

FOR SALE—68 colonies of bees. No disease. Extractor, supers, and outfit. Write for prices. A. G. Stow, Howard, Kansas.

FOR SALE—Carload bees, nuclei, pound packages, full colonies. See our ad elsewhere. The Stover Apiaries, Mayhew, Miss.

FOR SALE—10 fine colonies of Italian bees in 10-frame hives. Plenty winter stores. Alfred H. Thies, Ferguson, R. D. No. 32, Mo.

FOR SALE—Pound packages and nuclei for May delivery. Write for prices and terms. Safe arrival and satisfaction guaranteed. Tupelo Honey Co., Columbia, Ala.

WE are now equipped to handle your early spring orders for package bees, and Italian queens, especially bred for the production of honey. Prices will be in accord with the reduction in material and labor. Safe arrival guaranteed. Write for prices and terms. Sarasota Bee Co., Sarasota, Fla.

PHELPS GOLDEN QUEENS will please you. Mated, $2.00; 6, $10.00; or $18.00 a doz. C. W. Phelps & Son, Binghamton, N. Y.

BEES AND QUEENS from my Carolina apiaries —progeny of my famous Porto Rican pedigreed breeding stock. Elton Warner, Asheville, N. C.

SELECT THREE-BAND and Carniolan queens. Tested, $2.50; untested, $1.25. Will accept orders for spring delivery. Geo. W. Coltrin & Son, Mathis, Texas.

FOR SALE—300 colonies bees in 8-frame hives. All have plenty of honey for winter; also a lot of bee shipping cages and supers. Priced right. C. H. Cobb, Belleville, Ark.

QUEENS OF QUALITY for 1922. Three-banded Italians only. After April 15, untested, $1.25; tested, $2.00. Satisfaction guaranteed. P. M. Williams, Ft. Deposit, Ala.

1922 PACKAGE BEES AND QUEENS, untested and day-old, in Thompson safety introducing cages. Discounts on early advance orders. James McKee, Riverside, Calif.

FOR SALE—500 colonies in 4 yards, with power extractor, easy terms, near English colony. Very healthful, wonderful flows, local market. M. C. Engle, Herradura, Cuba.

WE are now booking orders for spring delivery of our queens and package bees. Write us your wants and ask for prices. Graydon Bros., Greenville, R. D. No. 4, Alabama.

BEES BY THE POUND — Also QUEENS. Booking orders now. FREE circulars giving details. See larger ad elsewhere. Nueces County Apiaries, Calallen, Texas, E. B. Ault, Prop.

FOR SALE—10 hives Italians in good 8 and 10 frame hives, free from disease, with supers and frames. Will trade for Ford or sell outright. Quirin Siefert, Batesville, R. D. No. 3, Ind.

SHE-SUITS-ME queens, season of 1921. Untested Italians: After June 15, $1.50 each, up to nine queens; 10 to 24 queens, $1.40 each; 25 and up, $1.25. Allen Latham, Norwichtown, Conn.

AM now booking orders for three-frame nuclei and queens of Dr. Miller's strain for 1922 delivery. I wish to thank my many satisfied customers for their patronage. S. G. Crocker, Jr., Roland Park, Baltimore, Md.

IF GOOD bright Italian queens are wanted by return mail, send your order to M. Bates, Greenville, Ala. Price, $1.00 each; $10.00 per dozen; $75 per 100. Pure mating, safe arrival, and satisfaction guaranteed.

TERMS considered to the right party. Will offer bees to parties being able to give good references. One-half cash and other half payable fall 1922. Will sell only 25 packages or more. Write for price and information. L. C. Mayeux, L. Box 4, Hamburg, La.

EARLY spring delivery, 1922. Three-banded stock only. One Hoffman frame emerging brood, one good untested queen, one pound bees, April delivery, $5.25 each package. Same as above, May delivery, $4.75. 5 per cent discount on 25 packages or more; 10 per cent deposit to book your order. L. C. Mayeux, Hamburg, La.

PHELPS' GOLDEN ITALIANS QUEENS combine the qualities you want. They are GREAT HONEY-GATHERERS, BEAUTIFUL, and GENTLE. Virgins, $1.00; mated, $2.00; 6 for $10.00. or $18.00 per doz.; tested, $5.00. Breeders, $10 to $20. Safe arrival guaranteed only in the U. S. and Canada. C. W. Phelps & Son, Binghamton, N. Y.

FOR SALE—Root's strain of Golden and leather-colored Italian queens, bees by the pound and nuclei. Untested, $1.50 each; select untested, $2.00; tested, $2.50 each; select tested, $3.00. For larger lots write. Circular free. A. J. Pinard, 440 N. 6th St., San Jose, Calif.

TO MY CUSTOMERS—Thanks for your valued patronage in 1921. It was our best year but one. With good stock introduced for miles around us, an increased and improved equipment, and 23 years' experience, we aim to give such quality and service as will merit your continued patronage. 1922 circular and price list ready in December. J. B. Hollopeter, Queen-breeder, Rockton, Pa.

FOR SALE—Package bees for spring delivery, three-band strain, bred for business. 20% cash books your order. Safe arrival and satisfaction guaranteed. A two-pound package of bees and select untested queen for $5.00; 25 or more for $4.75 each. Write for prices on larger lots. Caney Valley Apiaries, J. D. Yancey, Mgr., Bay City, Texas.

FOR SALE—Modern equipped apiary in Chicago's wonderful clover belt, 30 strong colonies of Italian bees, packed in winter packing cases. Portable extracting house, reversible extractor, Peterson uncapping melter, honey and wax separator, two-burner gasoline stove, large straining tank. Everything a beekeeper needs. For particulars write or see Anderson Bros., 533 Belmont Ave., Chicago, Ill.

FOR SPRING DELIVERY, 1922—One vigorous Italian queen, one frame emerging brood, one pound bees. Price, complete, f. o. b. Bordelonville, $5.00. Additional frames of brood, each $1.00; additional pounds of bees, each $1.00. Queen introduced and laying en route to you. Safe delivery and satisfaction guaranteed. No disease. Reference given. Orders booked one-fifth down. May delivery. Send for addresses of satisfied customers. Jes Dalton, Bordelonville, La.

FOR MAY AND JUNE DELIVERY—Place your order for our high-grade three-banded Italian bees and queens now. Take advantage of early order discounts by ordering now. We guarantee to please you. Prompt service and quality stock is our motto. We want your orders for bees on Root standard Hoffman frames, emerging bees. Pound packages and nuclei, with or without queens. Write for our prices and valuable information. Oscar Mayeux, Hamburg, La.

CALIFORNIA ITALIAN QUEENS, the old reliable three-banded stock that delivers the goods. Every queen actually LAYING before being caged, and fully guaranteed. I also guarantee safe arrival. SPECIAL FALL PRICES, select untested, 1, $1.25; 6, $7.00; 12, $13.00; 25 to 99, $1.00 each; 100 and over, 90c each. Package bees for next spring delivery. Circular free. California Apiaries, J. E. Wing, Prop., 155 Schiele Ave., San Jose, Calif.

NEW 1922 PRICES—On account of the present price of honey and recent reductions in the price of supplies we are now booking orders for our three-band leather-colored Italians at the following low prices: 2-lb. packages of bees, no queen, $4.00; untested queen, $1.25; 12, $13.50. Select untested, $1.50; 12, $15.00; tested, $2.25; 12, $20.00. No disease. Safe arrival in U. S. and Canada and satisfaction guaranteed. Write for circular and prices on quantities. J. M. Cutts, R. D. No. 1, Montgomery, Ala.

FOR SALE—1922 bees. Mr. Beeman, send your order early. First arrived, first served. Make shipment April 25 to June 5. Several years' experience. 1-lb. package three-band Italian bees, 1 untested queen, $5.50. 1st. We use pure sugar syrup; better than honey or candy to ship on; it contains water as well as feed. 2nd. Feeders are made more substantial, ⅓ larger and have screw cap that will not jar out. One-third down and balance just before shipment. Guarantee safe arrival all over U. S. and Canada. A. J. Lemoine, Moreauville, La.

FOR SALE—Pure Italian bees for 1922 spring delivery. Pound packages shipped with stores on Hoffman standard frames. Certificate of inspection with each shipment. Safe arrival and satisfaction guaranteed. 2 lbs. bees, $4.75; 3 lbs. bees, $6.25; 1-fr. nucleus, $3.75; 2-fr. nucleus, $5.75; add price of queen desired with each package. Untested queens, $1.00 each after May 1. Tested queens reared during fall 1921 especially for early shipment at $2.00 each, beginning April 15. 25% books your order. Discount on large orders. J. L. St. Romain, White Clover Farm & Apiary, Hamburg, La.

MISCELLANEOUS.

MEDICINAL roots and herbs are very profitable to grow. We especially recommend growing Golden Seal, which with good care will yield as high as $10,000 per acre for each crop. It takes several years to mature but will average $1000 a year. Special Crops, a monthly paper, tells how. Sample copy, 10c; $1.00 per year. Address Special Crops Pub. Co., Box "G," Skaneateles, N. Y.

WOULD you like to buy your beekeepers' supplies of yourself and have your honey sold for you and all the profits returned? This is what about fifty beekeepers in Michigan and adjoining States are doing. It only costs $10 per share to be one of the company of producers who are doing this same thing. If you live within a thousand miles of Detroit, Michigan, where we shall maintain a warehouse and office, you should take advantage of this proposition while there is stock for sale. The stock is nearly half taken without canvassing, and this notice should sell the balance of the $10,000 stock we are commencing with. E. D. Townsend, Northstar, Michigan, is chairman of the Board of Directors of the MICHIGAN HONEY PRODUCERS' EXCHANGE, INC. He is selling stock. All producers of honey in this territory should write him for full particulars.

HELP WANTED

WANTED—For the season of 1922 an experienced queen-breeder; state experience, reference, age, married, or single and wages wanted. Box 4, Loveland, Colo.

SITUATIONS WANTED

EXPERIENCED queen-breeder wants permanent position. Have been a commercial queen-breeder for nine years. Have reared over 100,000 queens, reared over 16,500 this season with two helpers. Age, 29; married, and wish permanent place. Give particulars in first letter. S. E. Merrill, Mayhew, Miss.

PATENTS Practice in Patent Office and Court.
Patent Counsel of The A. I. Root Co.
Chas. J. Williamson, McLachlan Building,
WASHINGTON, D. C,

The "BEST" LIGHT
Positively the cheapest and strongest light on earth. Used in every country on the globe. Makes and burns its own gas. Casts no shadows. Clean and odorless. Absolutely safe. Over 200 styles. 100 to 2000 Candle Power. Fully Guaranteed. Write for catalog. AGENTS WANTED EVERYWHERE.
THE BEST LIGHT CO.
306 E. 5th St., Canton, O.

Honey Markets.—Continued from page 673.

prised most of us, as not only has the carload demand been better than we expected, but large quantities of honey have been sold by beekeepers and others directly to consumers, and for this reason the quantity of extracted honey available for carload shipment is considerably smaller than was at first expected. It looks now as if there was a chance of getting all the good extracted honey cleaned up before the new crop comes on.

The Colorado Honey Producers' Ass'n.
Denver, Colo., Oct. 12. F. Rauchfuss, Secy'.

Special Foreign Quotations.

LIVERPOOL.—Stocks here are much reduced Only about 200 barrels remain in first hands. We do not hear of much Chilian coming to this market. There is no Pile 2 and 3 offering. The total sales of Chilian honey during the past month amount to about 850 barrels. The value of extracted honey in American currency is about 7½ cents per pound. There is very little doing in beeswax. The value in American currency is about 22 cents per pound.

Liverpool, Eng., Oct. 3. Taylor & Co.

Too Late for Classification.

FOR SALE—Six cases amber honey, two 60-lb. cans per case, $12.00 per case. Henry Schnauffer, 2793 N. 16th St., Cleveland, Ohio.

FOR SALE—Extra fancy clover honey well ripened and put up in new cans, 60 lbs. net; per case of two cans, $16.00. Edw. A Winkler, R. D. No. 1, Joliet, Ills.

HUBAM, or white annual sweet clover. Grow it for your bees, and get a seed crop, while the seed is scarce. Booking orders for fall delivery. E. G. Lewis Co., Media, Ills.

GUMMED labels of all sorts—as low as 60c per 1000—from your own copy. We also print for beekeepers at about half prices usually charged Will open account and let payment be made on receipt of goods. Roessler, Roseville, Newark, N. J.

BOOKS recommended by A. I. Root: Tile Drainage, 25c; A B C of Potato Culture, cloth, 75c; paper, 50c; Merrybanks and His Neighbors, 15c; Winter Care of Horses and Cattle, 25c; Tomato Culture, 25c. The A. I. Root Co., Medina, Ohio.

SALESMEN WANTED—To sell "Desert Gold" honey, America's favorite. Good positions, Begin now and work where you are or write for territory. Ladies invited to apply also. Fine winter work with good wages for right parties Give references first letter. Custer Battlefield Apiaries, Hardin, Mont.

A. I. ROOT AND WIFE GONE TO BRADENTOWN, FLA.

Mr. and Mrs. A. I. Root started for Florida on Oct. 18. They made the journey accompanied by J. T. Calvert They report on arrival that everything seems to be in nice shape. Usually A. I. Root does not leave for the South until after election; but as there is no great issue up he decided to leave before the weather becomes inclement in the North. A year ago he did not leave until a month later, and, as our readers will remember, it was cold nearly all the way driving down by auto.

Just now Mr. and Mrs. A. I. Root are rejoicing in the arrival of a new grandson, David Huber, born to Mr. and Mrs Huber Hall Root on Oct. 20.

Correction of Hubam Clover Advertisement.

In our October number, page 666, we printed an advertisement of the DeGraff Food Company, DeGraff, Ohio, in which it was said new Texas Hubam seed could be tested yet this year, and giving the price as $5.00 a pound and directing that orders be sent to the Henry Field Seed Co., or direct from grower who guarantees.

This advertisement was inserted wholly by error, being a repeat of an old advertisement printed last June. See the DeGraff Food Company's advertisement in this issue for their terms and conditions of offering Hubam clover seed.

GLEANINGS IN BEE CULTURE.

Guaranteed Hubam Clover

Beekeepers consider Hubam clover the greatest honey plant ever discovered. If planted by March 15 it will bloom by June 15 and continue blooming freely until a killing frost. Hubam will make a good honey crop regardless of the season. Honey produced from Hubam is water white. The wise beekeeper will get busy and plant a generous amount of this great plant next year. If you haven't the land plant all waste lands in your locality. The price is now $2 a pound. Be sure and get your seed while you can. Last year many were disappointed.

Sweet clover honey for sale, wholesale or retail.
F. M. SCHADER, SUNNYSIDE, WASH.

NORTHERN-GROWN HUBAM SEED

BEEKEEPERS:—Now is the time for all beekeepers to secure the new Hubam annual sweet clover seed for planting on waste land next spring, and to interest and educate their neighbors in planting it. It will pay any beekeeper to give away seed and to instruct neighbors how to grow it, in order to secure bee pasturage from one of the greatest honey-yielders known.

DEALERS:—This is just the time to get prices and to interest prospects for spring. Get the county agents back of this valuable new clover, and arrange with us to get your seed at once.

Hubam seed will be sold by all branch offices of the A. I. Root Company, and by many of our authorized distributers.

THE A. I. ROOT COMPANY
MEDINA, OHIO

1922

Place your order now for 1922 delivery of
FOREHAND'S THREE BANDS
The Thrifty Kind.

They are *surpassed by none but superior to many.*
Package Bees **Three-Banded Queens**
Write for prices now.

W. J. Forehand & Sons
Fort Deposit, Ala.

Our Guarantee and Advertising Conditions.

Believing that all the advertisers in this journal are trustworthy, we make the following guarantee of our advertising, together with a statement of the conditions we must exact both from our advertisers and from our subscribers who may patronize such advertisers:

OUR GUARANTEE (subject to conditions herein mentioned): We will make good to paid subscribers the loss of money that may be sent to any deliberate swindler or irresponsible advertiser by reason of any misleading advertisement that may be printed in our columns.

We will promptly discontinue the advertisement of any advertiser against whom a clearly valid complaint is made by a subscriber, and such advertiser will not be restored (if at all) to our columns until he has fully satisfied such complaint; furthermore, if we find that the facts sworn to in affidavit by the complainant and the circumstances warrant it, we will then not only exclude the advertiser from our columns, but at our own expense will proceed (by law, if necessary) to compel him to make restitution or to secure his proper punishment.

WHAT WE DO NOT GUARANTEE: We will not guarantee against bankrupts sanctioned by the courts. We will not guarantee the settlement of disputes between subscribers and honest advertisers, nor against loss and delay caused by honest advertisers who may be unable to fulfill conditions or contracts because of innocent misfortune or unfavorable conditions beyond their control. We will not guarantee any deal for bees and queens in which the purchaser advances the cash to the queen or bee rearer without an arrangement, either thru a bank or express company, whereby the purchaser can examine the bees or queens upon arrival and before the cash is released to the shipper—wishing our subscribers to take the same business care we ourselves would take in making a deal for queens or bees and trusting our "cash in advance" to those only who we know by experience have an established record of honest business dealing. (In making this last condition, we in no way challenge the right and propriety of the honest, business-like, prompt queen or bee rearer to ask pay in advance, either the whole or part, for he is worthy of such confidence, has proved himself, and can secure orders on cash-in-advance terms. But the purchaser should know his bee or queen dealer, if he is to advance the cash, and if he does so it must be at his own risk—not ours). We will not guarantee the purity of any seed advertised nor any nursery stock, as nurserymen ordinarily will not do this themselves; but any seedsman or nurseryman advertising in our columns will have given us excellent references in advance, and our readers may consider this fact in their favor. We will not guarantee advertisers more than one month after the last appearance of their advertisements in our columns. We will not guarantee temporary advertisers for "help wanted," "position wanted," nor advertisers of single sales or of small or second-hand articles, in which transactions the terms of bargain and payment are special and the purchaser can, by taking care, guard his own interests.

CONDITIONS INCUMBENT UPON OUR SUBCRIBERS: In order that our subscribers may secure the benefit of our advertising guarantee, in case of need to do so, they must mention in writing to advertisers that they are replying to an advertisement seen in Gleanings in Bee Culture. They must give notice of complaint against an advertiser within one month of the time of the transaction complained of, and only after having made written complaint to the advertiser in question; such complaint to us must be in the form of a sworn affidavit as to the facts set forth in the complaint, if the complainant wishes us to take up his claim against the advertiser; the right of examination of the article to be purchased before payment for it, must be demanded and made in all cases wherein the purchaser does not know to his full satisfaction the dealer of whom he is to purchase. Our subscribers will be solely responsible for the terms they agree to with advertisers and must use all reasonable caution and diligence in making such terms and in satisfying themselves of the conditions and quality of any article or commodity offered for sale.

CONDITIONS INCUMBENT UPON OUR ADVERTISERS: We reserve the right, at any time, to cancel any advertising contract and discontinue advertisement, and refund, pro rata, for space not furnished under contract. Every advertiser, unless well known to us and with an established record for honest and prompt dealing, will be required to furnish satisfactory credentials as to both character and financial standing, the endorsements of a local banker, postmaster, and official, or three other endorsements equally as good, being asked for by us. Queen and bee rearers, who seek to advertise in our columns, must furnish not only satisfactory character and financial references, but must sign our Code for the Sale of Queens and Bees, answer our questionnaire as to their beekeeping and apiary conditions; and, if new in the business of selling queens and bees, must furnish us with the endorsement of at least five reputable beekeepers or a beekeepers' society, or give an indemnity bond, or furnish us with both the endorsement of beekeepers and the bond. All advertisers must not only deal honestly, but they must follow correct business practice, be prompt in business correspondence and in the delivery of goods, or else expect to be barred from our advertising columns for such business delinquencies.

WHAT WE SEEK TO ACCOMPLISH: By this guarantee and its conditions we seek the accomplishment of two purposes: to drive the unreliable advertiser out of our columns and even punish him by law if he so deserves and it is possible to do it; to be relieved of the burden thrown upon us in the past by the unwise deals of our readers and unjust complaints against honest advertisers.

GLEANINGS IN BEE CULTURE,
The A. I. Root Co., Publishers.

INDIANOLA APIARY

is now booking orders for 1922 for Italian bees and queens. Write for price list and circular. No disease. Bees inspected by State inspector.

J. W. SHERMAN
Valdosta, Ga.

Shrubs and Trees

That provide Nectar for the Bees and Fruit for the household. No Cash with order. Get our Catalog TODAY.

PROGRESS NURSERIES
1317 Peters Ave. Troy, Ohio

Established 1885.
Write us for catalog.

ALWAYS
ON
TOP

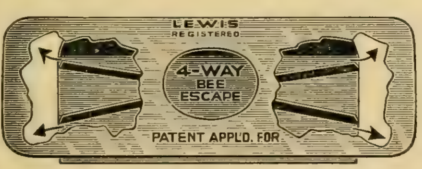
BEEKEEPERS' SUPPLIES

The Kind You Want and the Kind That Bees Need

We have a good assortment in stock of bee supplies that are mostly needed in every apiary. The A. I. Root Co.'s brand. Let us hear from you; information given to all inquiries. Beeswax wanted for supplies or cash.

John Nebel & Son Supply Co.
High Hill, Montgomery Co., Mo.

LEWIS 4-WAY BEE ESCAPES



Four exits from supers. Fits all standard boards. Springs of coppered steel. Made of substantial metal. Price each 20c postpaid. Made by

G. B. Lewis Company, Watertown, Wis., U.S.A.
Sold only by Lewis "Beeware" Distributors.

MASON BEE SUPPLY COMPANY
MECHANIC FALLS, MAINE

From 1897 to 1921 the Northeastern Branch of The A. I. Root Company.
PROMPT AND EFFICIENT SERVICE
BECAUSE—Only Root's Goods are sold.
It is a business with us—not a side line.
Eight mails daily—Two lines of railway.
If you have not received 1921 catalog send name at once.

"Best" Hand Lantern

A powerful portable lamp, giving a 300 candle power pure white light. Just what the farmer, dairyman, stockman, etc. needs. Safe—Reliable—Economical—Absolutely Rain, Storm and Bug proof. Burns either gasoline or kerosene. Light in weight. **Agents wanted. Big Profits. Write for Catalog.** THE BEST LIGHT CO.
306 E. 5th St., Canton, O.

Bees & Queens for 1922

10 Per Cent Discount for Orders Received Before 1922

One 1-frame nucleus with untested queen, $4.00; one 2-frame nucleus with untested queen, $5.00; untested queens, $1.25 each; 12, $1.10 each; tested queens, $1.60 each; 12 or more, $1.35 each; select tested queens, $2.00 each. Breeders, $5.00 at all times.

H. L. MURRY, SOSO, MISS.

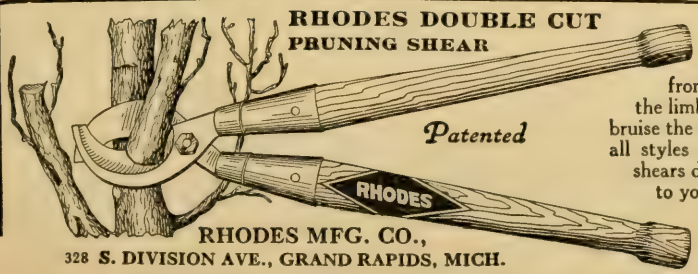
RAW FURS

Graders' Guide and Price List Free

READY NOVEMBER 20

GEO. E. KRAMER, Valencia, Pa.

RHODES DOUBLE CUT PRUNING SHEAR



THE only pruner made that cuts from both sides of the limb and does not bruise the bark. Made in all styles and sizes. All shears delivered free to your door. Write for circular and prices.

RHODES MFG. CO.,
328 S. DIVISION AVE., GRAND RAPIDS, MICH.

New Prices on Friction-Top Pails

	25	50	100	200	500	1,000
2½-lb. cans	$1.50	$2.25	$ 4.10	$ 8.00	$19.50	$38.00
5-lb. pails	2.15	3.90	7.45	14.60	34.50	67.50
10-lb. pails	2.75	5.25	10.00	19.75	47.50	94.00

5-lb. Pails in reshipping cases of 12	$1.30; ten cases	$12.00
10-lb. Pails in reshipping cases of 6	1.00; ten cases	9.00
1-lb. Round jars, 24 to case, per case	1.70; ten cases	16.50
½-lb. Round jars, 24 to case, per case	1.50; ten cases	14.00
6½-oz. Tumblers, 48 to case, per case	1.65; ten cases	16.00

Comb Honey Shipping Cases

There is an increasing interest in the production of Comb Honey, and a material reduction in price on the shipping cases. You will get better prices for your honey if put up in these attractive packages. We quote below:

	10	50	100
24-lb. four-row for 1⅞-in. sections	$6.00	$29.00	$57.50
24-lb. four-row for 1½-in. sections	5.85	28.35	56.00
24-lb. four-row for 4 x 5 sections	5.85	28.35	56.00

Paste for Tin and Glass Packages

We have a very excellent paste for fastening labels on your glassware or pails. THEY STICK. We are quoting prices below. Postage extra.

"A" grade paste, per pint	$ .30
"A" grade paste, per quart	.55
"A" grade paste, per gallon	2.00

5% Cash Discount for November Orders

This discount applies to goods wanted for use next season, and does not apply to orders for honey containers listed above.

BUY NOW the goods you need for next spring, taking advantage of the discount, and getting them ready for use during the winter months. Quantity discount allowed on the larger orders in addition to the early order discount. Quotations gladly furnished on the list of goods you need, showing exact cost.

WE SELL "ROOT QUALITY" BEE SUPPLIES ONLY.

M. H. HUNT & SON
510 North Cedar Street, Lansing, Michigan

NEWMAN'S ITALIAN QUEENS BRED FROM THE BEST ABSOLUTELY FIRST QUALITY and fully guaranteed. No disease. Satisfaction and safe arrival. Untested, $1.25; 6, $7.00; 12, $13.50. Select Untested, $1.75; 6, $9.00; 12, $17.00. Circular free.

A. H. NEWMAN, Queen Breeder
MORGAN, KY.

Buy Your Bee Supplies Now

Take advantage of early-order discounts by ordering NOW. We guarantee to please you. "Prompt service and the very best" is our motto. *We want your beeswax and old comb.* Highest cash and trade prices offered. Texas beekeepers should write A. M. HUNT, Goldthwaite, Texas.

Manufactured by
Leahy Manufacturing Company
95 Sixth St., Higginsville, Missouri
Write for FREE catalog. It is to your interest.

Southern Headquarters
Reliable Three-Banded Italian Queens
By Return Mail

Large, vigorous, well marked. Guaranteed to please you. We can make deliveries to Oct. 20.

Untested	
Each	$1.00
Six	5.50
Twelve	10.50
Twenty-five	20.00
Fifty	38.00
Tested	
Each	$1.75

Safe arrival and satisfaction guaranteed.

W. D. ACHORD
FITZPATRICK, ALA.

Bees & Queens for 1922

Is there a great difference among bees and queens? Mr. Beekeeper, with bees and queens a small difference counts high. A small per cent better laying queen will greatly increase the field force; this will insure a larger honey yield per colony. A small per cent better worker will aid wonderfully. A small per cent more gentleness will greatly reduce the stings; this increases the efficiency and speed of handling, not counting the pleasure. A small per cent of better marking adds wonderfully to the beauty of the colony. By developing the small qualities of my bees and queens I have attained marked success in producing better queens and bees. My aim is to produce bees and queens that will meet the high standard required by beekeepers. Let me book your order for 1922. One-fourth the full amount will insure your getting bees and queens when you want them most next spring. Perfect satisfaction, safe delivery, and pure mating guaranteed. Pure Italian bees and Three-Band Italian queens of the better kind.
Untested—1, $1.50; 6, $7.50; 12, $13.50. Selected Untested—1, $1.75; 6, $9.00; 12, $16.50. Tested—1, $2.50; 6, $13.00; 12, $24.50. Selected Tested—1, $4.00; 6, $22.00; 12, $41.50. One pound bees, $2.75; two pounds bees, $4.75; three pounds bees, $6.75. If queen is wanted with bees add price. Write for prices on large lots.

N. FOREHAND, RAMER, ALABAMA

BANKING BY MAIL AT 4%

Don't Tie Up Your Money

but put it where it will grow under your own control and faster than in any other safe way.

Write for our "Banking by Mail" booklet.

THE SAVINGS DEPOSIT BANK CO.
A. T. SPITZER, Pres.
E. R. ROOT, Vice Pres. E. B. SPITZER, Cash.
MEDINA, OHIO

Slum Gum
Old Combs

worked into beeswax at 5c per pound, minimum charge $1.00. Pay taken from wax.

Market price paid for the wax, worked into foundation, or traded for supplies.

Working Beeswax into foundation is a specialty with us.

Ship to Falconer, New York. Mark each package with your name and address both inside and outside.

Write for Red Catalog of Beekeepers' Supplies and REDUCED price list.

W. T. Falconer Mfg. Co.
Falconer, N. Y., U. S. A.

"Where the best beehives come from."

CANDY FOR WINTER FEED

In winter bees sometimes starve with plenty of honey in the hive. Use candy and avoid this unnecessary loss. Put up in large paper plates weighing two pounds each. Write for price, also catalog of Bee Supplies.

H. H. JEPSON
182 Friend St. Boston, 14, Mass.

ROOT'S BEE SUPPLIES

Carload stocks at Ohio's distributing center. Orders filled the day they come in. Save time and freight by ordering from

A. M. MOORE, Zanesville, Ohio
22½ S. Third Street.

World's Best Roofing at Factory Prices

"Reo" Cluster Metal Shingles, V-Crimp, Corrugated, Standing Seam, Painted or Galvanized Roofings, Sidings, Wallboard, Paints, etc., direct to you at Rock-Bottom Factory Prices. Positively greatest offer ever made.

Edwards "Reo" Metal Shingles

cost less; outlast three ordinary roofs. No painting or repairs. Guaranteed rot-fire, rust, lightning proof.

Free Roofing Book

Get our wonderfully low prices and free samples. We sell direct to you and save you all in-between dealer's profits. Ask for Book No. 188

LOW PRICED GARAGES

Lowest prices on Ready-Made Fire-Proof Steel Garages. Set up any place. Send postal for Garage Book, showing styles.

THE EDWARDS MFG. CO.,
1138-1188 Pike St., Cincinnati, O.

FOR YOUR 1921 CROP

Comb honey shipping cases, honey cans, friction-top pails. Price on application.

Early order cash discount on sections, hives, supers, frames, comb foundation, and other goods.

Buy now and get supplies ready for 1922. Make out your list, and send for our prices.

AUGUST LOTZ COMPANY, BOYD, WIS.

Every Step in Beekeeping

By Benjamin Wallace Douglass

A brand-new book based on the most up-to-date scientific information and thorough practical experience that tells how to keep bees for profit.

A book of directions, every step made clear, so that the beginner may start right and go forward without floundering. Delightfully written. Author was formerly State Entomologist of Indiana and has been a successful beekeeper for years.

Illustrated with thirty-one photographs. Price $2.50. Sent postpaid on approval to any subscriber if the name of this paper is mentioned.

THE BOBBS-MERRILL CO.
Vermont Plaza, Indianapolis, Ind.

A Cinch for Beekeepers

That's what HUBAM means

It makes a wonderful honey flow from early summer to killing frost; is a splendid legume for pasture or hay; and a luxuriant growth to plow under for humus and plant food. Besides this, the cash crop from the seed alone is no small item. Our average yield has been 400 lbs. per acre. Let us send you our Seed Sense magazine free. Tells all about it. We offer genuine, certified HUBAM at $2.00 per pound on early orders.

Henry Field Seed Co.
SHENANDOAH, IOWA.

5 REASONS WHY---

You will want to send us the coupon at once

Money Saved Is Money Made

The A. I. Root Co. of Iowa,
Council Bluffs, Iowa.

Gentlemen:—Kindly name your fall prices of the following:

1. Eight-frame hives, metal covers, complete, sets 5 KD.
2. Eight-frame bodies, with frames, complete, sets 5 KD.
3. Shipping cases, lots of......
4. Cans, jars, pails, and second-hand 5-gal. cans.
5. Honey tanks.

Name ....

Address ....

City ....

State ....

THE A. I. ROOT CO. OF IOWA
COUNCIL BLUFFS, IOWA

Guaranteed Seed of the Greatest Honey Bearing Clover

Enthusiasm for Hubam (the annual white sweet clover) as a honey-bearing plant is constantly growing among beekeepers. It blooms in three to four months and continues blooming for a longer period than other honey-bearing plants.

Hubam has a legume action that makes it one of the greatest soil-builders. It bears hay and seed in great quantities. And it saves a full year in the usual crop rotation.

These advantages have made it popular in a wonderfully short time.

We are large-scale growers of Hubam seed with acreage in Texas, Ohio, and North Dakota. Because accidental mixing of this seed is easy we grow nothing but Hubam, and absolutely guarantee the purity of the seed shipped under our seal.

DE GRAFF FOOD COMPANY, SEED DEPT. 303, DE GRAFF, OHIO

The Rosedale Apiaries

Big Bend, La.

J. B. MARSHALL and
H. P. LE BLANC, Props.

Can supply you promptly April 15th to May 30th, 1922, with the very best Italian Bees and Queens at following prices:

1-fr. nucleus, 1 lb. bees	$3.00
2-fr. nucleus, 2 lbs. bees	6.00
Add price of queen.	
Untested Queens, each	1.50
Tested Queens, each	1.75

No bee disease in territory. Health certificate goes with each shipment.

Special prices to large orders.

Package Bees and Reliable Queens

GOLDEN AND THREE-BANDED ITALIANS

We are now in a position to accept orders for queens and bees for 1922 shipping, in large quantities.

We have the stock and the equipment and experience necessary to handle your orders, whether large or small, and promptly and in a satisfactory manner. All packages are headed with large vigorous young queens of our own production. You will be pleased with the stock and service we can give you. Write for our price list.

E. A. SIMMONS
GREENVILLE, ALA.

Our Food Page—Continued from page 698.

STANDARD CAKE RECIPE.

¼ cup butter or margarine
1 cup sugar
2 eggs in measuring cup
Milk to fill cup
1½ to 1¾ cups sifted pastry flour
3 level teaspoons baking-powder
⅛ teaspoon salt
¾ teaspoon flavoring extract

HALF SIZE FOR SMALL FAMILY.

2 level tablespoons margarine
½ cup sugar
1 egg in measuring cup
Milk to fill cup half full
¾ to ⅞ cup sifted pastry flour
1½ teaspoons baking-powder
A few grains salt
⅜ teaspoon flavoring extract

Measure the margarine or butter by filling a measuring cup ¾ full of cold water and adding enough margarine to make it even full. Pour out the water and put the margarine into a mixing bowl, which has been warmed by rinsing in boiling water. While the margarine is softening slightly, measure the flour, after once sifting, and after reserving a little put the rest into the sifter with the baking-powder and salt. The flour should be measured by dropping it lightly into the cup without shaking it down. This recipe takes 1¾ cups of the brand of pastry flour I am using at present, but flours vary so much in absorbing power that it is impossible to give the exact measurement. Even the same brand varies at different times. The batter should be thick enough to drop from the mixing spoon rather than pour in a thin stream. Break the eggs in a cup, beat lightly with a fork and then fill the cup with sweet milk. Cream the margarine in the bowl, add the sugar gradually, working it until smooth and add the flavoring extract. Then add about a third of the combined milk and egg and sift in a third of the flour, beating until smooth, and continue adding them alternately until all the flour and liquid are in, using the reserved flour, if necessary. Beat the batter vigorously about a minute, divide into two layers or put it all in a loaf pan and bake in a moderate oven, 15 to 20 minutes for the layers and about 40 minutes for the loaf. The pans should be well greased and flour lightly sifted over the surface.

Any preferred filling or frosting may be used with this cake or 1 cup of chopped nuts may be added to the batter. It will make twelve good-sized individual cakes.

LARGE, HARDY, PROLIFIC QUEENS

Three-band Italians and Goldens. Pure mating and safe arrival guaranteed. We ship only queens that are top notchers in size, prolificness, and color. After June 1st: Untested queens, $1.50 each; 6 for $8.00; 12 or more, $1.40 each; 25 or more, $1.25 each. Tested queens, $3.00 each; six for $16.00.

Buckeye Bee Co., Justus, Ohio.

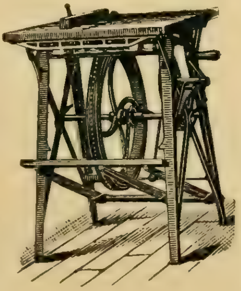
BARNES'
Hand and Foot Power Machinery

This cut represents our combined circular saw, which is made for beekeepers' use in the construction of their hives, sections, etc.

Machines on Trial

Send for illustrated catalog and prices.

W. F. & JOHN BARNES CO
545 Ruby Street
ROCKFORD, ILLINOIS



Completely Destroys the Weed Growth

More than that, the BARKER breaks the hardest crust into a level, porous, moisture-retaining mulch — **all in the same operation.**

A ten-year-old boy can run it—do more and better work than ten men with hoes. Saves time and labor, the two big expense items.

BARKER WEEDER, MULCHER AND CULTIVATOR

Eight reel blades revolve against a stationary underground knife—like a lawn mower. **BEST WEED KILLER EVER USED.** Works right up to plants. Cuts runners. Aerates the soil. Has leaf guards, and shovels, for deeper cultivation—3 *garden tools in* 1.

FREE ILLUSTRATED BOOK.

Tells how gardeners and fruit-growers everywhere are reducing their work; increasing their yields.—How to bring growing plants through a dry season.—How to conserve the moisture and force a larger, more rapid growth. **Send** TODAY for this free, illustrated book and special Factory-to-User offer.

BARKER MANUFACTURING COMPANY

Dept. 23. David City, Neb.

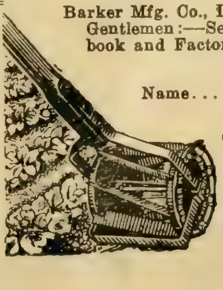
Barker Mfg. Co., Dept. 23, David City, Neb.
Gentlemen:—Send me postpaid your free book and Factory-to-User offer.

Name.......................

Town................

State...............

R. F. D. or Box.........



QUEENS FULL COLONIES AND NUCLEI QUEENS

Our bees are hustlers for honey, prolific, gentle, very resistant to European Foul Brood, our customers tell us. For years we have been shipping thousands of queens and pounds of bees all over the U. S. A. and Canada. We are continually getting letters with statements such as the following: "Well pleased with your stock," "Best we ever had,' '"The bees we got from you are the tops (best) we have in our 225 colonies," "Bees arrived in fine shape, well pleased," etc., etc. Write for circulars giving details, etc. We are quoting a lower price for balance of the year, but will still hold up the high standard of quality.

I have a good proposition for 2 or 3 Northern beekeepers that would like to come South this fall. Write for particulars.

QUEENS AFTER JULY 1st, BALANCE OF THE YEAR:

Untested ....$1.35 each	25 or more, $1.00 each	1 lb. of bees..$2.25 each	25 or more, $2.13 each
Select Unt. .. 1.50 each	25 or more, 1.25 each	2 lbs. of bees.. 3.75 each	25 or more, 3.56 each
Tested ...... 2.25 each	25 or more, 1.75 each	3 lbs. of bees.. 5.25 each	25 or more, 4.98 each
Select Tested.. 2.75 each	25 or more, 2.00 each	Add price of queen wanted when ordering bees.	

Safe arrival guaranteed within six days of here.

MY FREE CIRCULARS FOR 1922 SHIPPING, quoting lower prices for package bees and queens, are ready to mail. Send for one before placing your order.

One of my customers from Canada wrote he was getting an average of over 200 lbs. this year from bees bought of me last year. Another wrote he was getting 90 pounds this year from packages bought this spring.

NUECES COUNTY APIARIES

E. B. AULT, Prop. **CALALLEN, TEXAS**

Italian Bees and Queens

Book your order now for 1922 delivery. If prices decline we will protect you, if they advance you get your bees at these prices.

2,000 Colonies

FREE OF DISEASE and headed with young queens to draw from. **REMEMBER YOU ABSOLUTELY CAN'T GET DISEASE FROM US.**

POUND PACKAGES---NOTE, WITH QUEEN

1-lb. package, with queen,	$4.00;	10 or more $3.50
2-lb. package, with queen	5.50;	10 or more, 5.00
3-lb. package, with queen,	7.25;	10 or more, 6.75

NUCLEI---NOTE, WITH QUEEN

1-fr. nucleus, with queen,	$4.00;	10 or more, $3.50
2-fr. nucleus, with queen,	5.50;	10 or more, 5.00
3-fr. nucleus, with queen,	7.25;	10 or more, 6.75

We are in position to fill orders for, from 100 to 4,000 nuclei or packages. Write us. Safe arrival and satisfaction guaranteed. Reference, any Bee Journal.

TERMS: 25% TO BOOK ORDER.

THE STOVER APIARIES, MAYHEW, MISS.

THREE-BANDED **LEATHER-COLORED**

20,000 Italian Queens for 1922
4,000 Packages and Nuclei

SOUTHLAND QUEENS

THEY EXCEL

Bred from Root Home-Bred Selected Breeders. Backed by over 50 years' experience in breeding the Best, Most PROLIFIC queens of today.

EXTREMELY PROLIFIC BRED FOR SERVICE

A FEW VOLUNTARY LETTERS.

New Liskeard, Ont., Canada.

Your queens are the largest, finest, most prolific I have ever handled. Have purchased queens from the largest breeders in the country and yours surpass them all. They are hardy, resistant. They eat up E. F. B. Am telling all my neighbors about your queens.

———————.

Slater, Wyoming, Sept. 22, 1921.

Queens arrived O. K. Received Sept. 9th. A day and a half from the time the queen was turned loose there were FOUR frames filled with eggs. Thanking you for your good queen, I remain,

———————.

Vancouver, B. C., Sept. 1, 1921.

We received the queens several days ago. I might say that while I have imported several hundred queens this year these are the best in the Leather-colored Italians that have been imported yet. The leather-colored bees are winning favor over the goldens in this province.

———————.

20,000————**QUEENS**————20,000

Untested, $1.50; 12 or more, $1.25; 25 or more, $1.15; 50 or more, $1; 100 or more, 90c.
Tested, $2.50; 12 or more, $2.25; 25 or more, $2.15; 50 or more $2; 100 or more, $1.90.

POUND PACKAGES—SHIPPED ON COMB OF FOUNDATION
(F. O. B. Shipping Point by Express.)
1-lb. package, no queen, $3.00; 25 or more, $2.25; 50 or more, $2.15
2-lb. package, no queen, $5.00; 25 or more, $3.75; 50 or more, $3.50
3-lb. package, no queen, $7.00; 25 or more, $5.25; 50 or more, $5.00

NUCLEI

Good strong combs—filled with brood. Same prices respectively as pound packages.

WE GUARANTEE SAFE ARRIVAL. MISMATED QUEENS REPLACED. BOOK YOUR ORDER NOW. OUR SUPPLY IS LIMITED.

THE SOUTHLAND APIARIES

BOX 585, HATTIESBURG, MISS.

BEDTIME STORIES for the Children
CURRENT EVENTS and EDITORIALS
STORIES and HOME HELPS for Mother
for ALL
Bright Girls find 100 Features
Live Boys always like the things to DO and to MAKE and STORIES of ADVENTURE and SPORT
THE YOUTH'S COMPANION
TRADE-MARK REG. U.S. PAT. OFF.

52 issues a year — not 12

Start a year To-day

The Youth's Companion

A LIVE, TIMELY, moving feast of good things *and you will get them nowhere else.* The Y C is unique in its reader-serving, home-serving, community-serving power. It is vastly more than reading. It is a friend and inspirer and an entertainer also. It tells how to do things—how to earn—how to save. It helps every interest of everyone in the family.

SERIALS, SHORT STORIES, EDITORIALS, ARTICLES, POETRY, NATURE AND SCIENCE, CURRENT EVENTS, DOCTOR'S CORNER, RECEIPTS. STAMPS TO STICK, GAMES, SPORTS, PUZZLES, "HOW-TO-MAKE" PAGES, SUGGESTIONS FOR HOME EFFICIENCY AND ECONOMY.

". . . Let me tell you before closing just how much our whole family does enjoy The Companion," writes a subscriber. "Father, mother and the boys all find something of interest in each copy. I thot I was doing the lad who asked me for my subscription a favor when I subscribed. I found that he was doing our whole family one instead."

The Companion cements the Family; the Family cements the Nation

The Companion is one of the strongest forces for making America a land to love and to serve with loyalty. Every page reflects ideals—ideals for the boy and the girl, ideals for the parents in their relations with each other and their children and the world. It is a constant stimulant to high thinking, to clean living, to patriotism.

Start a Year To-day

EVERY NEW SUBSCRIBER who cuts out and sends this slip with the subscription price will at once begin to receive the extra issues indicated:

1. THE YOUTH'S COMPANION for 1922
52 Splendid Weekly Issues
2. All the remaining 1921 Weekly Issues
3. 1922 Companion Home Calendar Free

ALL FOR $2.50

GLO

THE YOUTH'S COMPANION, BOSTON, MASSACHUSETTS

Why Buy Now?

There are two good reasons for buying your bee supplies now.

1. By so doing you will save money.
2. By buying now you can be putting your supplies together and getting them all ready this winter, so as to be prepared when they are needed in the spring.

Why You Will Save Money By Buying Now

Our recent sharp cuts in prices of supplies were much greater than today's costs justify. Some materials are actually advancing again. It is our honest belief that prices will not go any lower.

But the biggest reason why you will save money by ordering now, is on account of our **EARLY ORDER DISCOUNT**—

5 per cent for November
4 per cent for December

This EARLY ORDER CASH DISCOUNT is bound to save you money. We give this discount now in order to stimulate trade during an otherwise dull period, thereby keeping our plant going to capacity to decrease burdens and overhead, and enabling us to sell our goods to you for less money. **Help us to help you. It will pay you to order now and take these discounts.**

Business confidence is returning. Trade will be brisk next spring. Don't get caught in the rush. The late ones always get caught and have to wait. Delay during the honey flow is needless waste and expense.

For your convenience, and in order to save you on freight, the following distributing points are maintained:

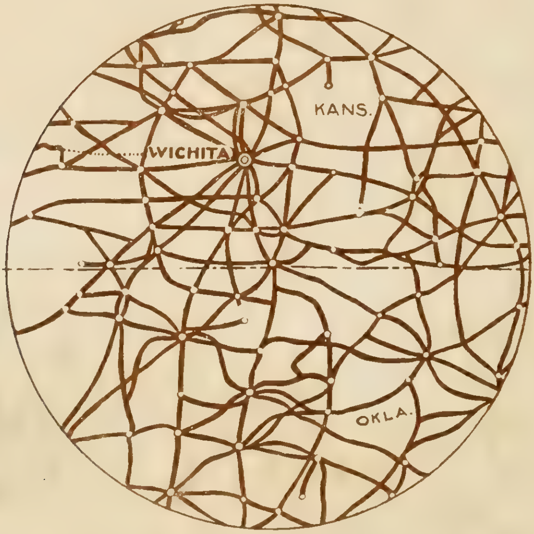
New York, 23 Leonard St.
Philadelphia, 8-10 Vine St.
Chicago, 224 W. Huron St.
Indianapolis, 873 Mass. Ave.
St. Paul, Minn., 290 E. 6th St.
Norfolk, Va., 10 Commerce St.
New Orleans, La., 224 Poydras St.
Syracuse, N. Y., 1631 W. Genesee St.
Savannah, Ga., 126 W. Bay St.

"There Is a Root Dealer Near You"

THE A. I. ROOT COMPANY, MEDINA. OHIO

52 Years in the Bee Supply Business

“Beeware” and Wichita



For the benefit of beekeepers of the Central Southwest and to answer an ever increasing demand from the beekeepers of that territory, a branch of the G. B. Lewis Company is being established at Wichita. Note the railroad facilities.

Lewis workmanship, “Beeware” quality and Wichita shipment will be three of a kind. Call and see us at 415 So. St. Francis Street, Wichita, Kansas.

BEE HIVES AND APIARIAN EQUIPMENT
BEWARE
WHERE YOU BUY YOUR
BEEWARE
WATERTOWN **WIS.** U.S.A.
MAKES THE FINEST.
COPYRIGHT, 1916, BY G. B. LEWIS COMPANY

G. B. LEWIS COMPANY

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WATERTOWN, WISCONSIN, U. S. A.

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College

Gleanings
in
Bee Culture

I heard the bells on Christmas day
Their old familiar carols play,
And wild and sweet
The words repeat
Of peace on earth, good will to men.
— *Longfellow.*

VOL. XLIX December 1921 NUMBER 12

LOWER PRICES

Pending the publication of our new catalog, send us your lists of requirements of bee supplies and we will quote you our new prices. New catalog out January, 1922, mailed on application.

THE MILLER BOX MANUFACTURING CO.
LOS ANGELES, CALIF.

"Griggs saves you freight."

TOLEDO

By the time you read this our 1921 crop will be history. How about your Honey Cans, Comb-honey Cases, Extractors? Let us know your wants. We can serve you promptly and well.

Honey, New Crop

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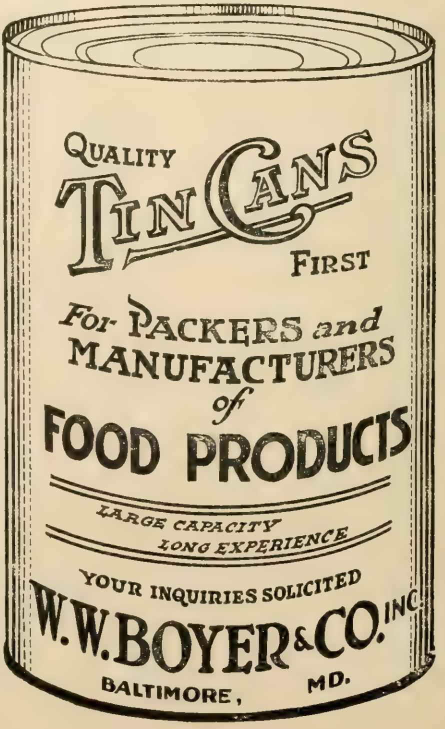
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Editorial Staff

Geo. S. Demuth and E. R. Root	A. I. Root	H. H. Root	H. G. Rowe
Editors	Editor Home Dept	Assistant Editor	M'n'g Editor

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HONEY MARKETS

U. S. Government Market Reports.

INFORMATION FROM PRODUCING AREAS (FIRST HALF OF NOVEMBER.)

CALIFORNIA POINTS.—Demand has been better and movement heavier during past two weeks. Market firm, better feeling. Stocks continue to decrease. The heaviest movement is on light amber alfalfa; supplies of other grades, especially white stock, limited. Due to late rains colonies in southern California have more brood than usual at this date, and as a result winter stores are being consumed too rapidly. Carloads f. o. b. usual terms at loading points, white orange, no sales reported, supplies nearly exhausted; white sage mostly 11½c, light amber sage 8½, light amber alfalfa 6½-7c, mostly 6½c. Considerable California honey being sold by producers in small lots at prices averaging 3-7c higher than carload prices. Hawaiian carloads f. o. b. San Francisco, white 6½c, light amber 5c, honeydew 4c. Beeswax: Market very quiet, too few sales to establish market.

INTERMOUNTAIN REGION.—Shipments continue heavy, and supplies in most sections are moving rapidly out of beekeepers' hands. Wire inquiry not so active but still good; offerings still liberal. Summer frosts following a warm spring weakened some colonies, but due to fine fall weather allowing late brood development, there are plenty of young bees. Stores are ample in most areas, and bees in good condition. Quality of the honey reported below normal in some localities. In parts of Idaho the alfalfa weevil has proved very destructive to beekeepers. In Arizona, altho the season was considered a failure, heavy shipments have been made of hold-over 1920 honey. Extracted: White sweet clover and alfalfa have ranged f. o. b. loading stations 7-9c, with some shippers holding for 10c per lb. Arizona light amber alfalfa and cotton 5½c, light amber mesquite 6-6¾c. Comb: 24-section cases white alfalfa and sweet clover, mostly $4.25-5.00, some high as $5.75, and some darker grades lower.

PACIFIC NORTHWEST.—Spray poisoning has proved a real menace. Thousands of colonies were killed by feeding on alfalfa blooms in sprayed orchards, and many other colonies rendered partially unproductive. Bees not badly poisoned recuperated as a result of the late honey flow; colonies in favorable unpoisoned districts gave bumper crops. White honey selling 10-12c per lb.

TEXAS POINTS.—Late honey flow in some sections not sufficient to carry colonies thru the winter, necessitating feeding. In other areas the fall flow was heavy. White extracted honey has been moving at an average price of 8-9c per lb. and chunk comb can be bought for 12-12½c per lb.

EAST CENTRAL STATES.—The good fall flow from goldenrod and asters has filled up brood-nests nicely for the winter in Ohio, Indiana, and Kentucky. Northern Illinois and southern Wisconsin had just enough fall flow to stimulate brood-rearing unseasonably, and unless liberal feeding is resorted to, a heavy winter loss is looked for in this area. Many beekeepers are continuing their last year's practice of selling their honey in bottles, jars, and pails direct to retailers and consumers. In fact, some beekeepers are already buying of their neighbors to supply calls for direct shipment.

PLAINS AREA.—Shortage of fruit bloom, followed by hot dry weather in the summer have resulted in portions of Iowa experiencing a most disastrous season. Beekeepers who have not had to feed for 40 years were obliged to feed sugar syrup heavily to keep bees thru the winter. White extracted selling at 9-12c per lb, amber 7c.

NORTHEASTERN STATES.—Late crop of buckwheat and goldenrod was one of the heaviest on record, and helped make up for lighter yield of white honey. Late swarming has been excessive, but August-September swarms have secured sufficient stores so no feeding will be necessary. Bees are in unusually good condition. Extracted white clover selling at 8½-11c per lb., and buckwheat at 5½-7½c. Comb honey ranges $4.50-5.00, some $5.50 for white, and $3.50-4.50 for dark.

SOUTHEASTERN STATES.—Fall flow a failure in some sections; in others, honey still coming in as late as Nov. 1. Brood-rearing greatly encouraged by favorable weather. Demand poor, ascribed to business depression. White honey selling 10-12½c per lb., light amber 7½-8c, dark amber low as 6c.

TELEGRAPHIC REPORTS FROM IMPORTANT MARKETS.

BOSTON.—250 cases by boat California and 100 cases New York arrived since last report. Demand good for extracted, moderate for comb, market firm. Comb: Sales to retailers, New Yorks, 24-section cases No. 1 white clover $6.00-7.00, few $7.50. Vermont, 20-section cases No. 1 white clover $6.50 to $7.00, light low as $5.00; 24-section case fancy carton stock mostly $9.00. Extracted: Sales to confectioners and bottlers, Porto Rico, amber 80-85c per gal. Cuban, amber 75-80c per gal. California white sage 15-16c, mostly 16c per lb. Brokers' nominal l. c. l. quotations delivered Boston basis, California white sage 12-13c, light amber sage 10c per lb.

CHICAGO.—1 car Nevada, 1 car Wyoming, 2,000 lbs. Michigan, 3,000 lbs. Wisconsin arrived since last report. Demand has been improving steadily for past month or so but prices have undergone but slight improvement. Present tone steady with operators a trifle more optimistic. Quite a lot of old crop stock around, most of which is ordinary quality and moving at liberal discount. Extracted: Sales to bottlers and candy manufacturers, per lb. Wisconsin and Michigan, basswood and clover, white 11½-13c, light amber 9-10½c. Wyoming, Nevada, and Colorado, mixed alfalfa and clover white 11-11½c, light amber mostly 10c. Comb: Sales to retailers, Ohio, Wisconsin, and Minnesota, mixed clover and alfalfa 24-section cases No. 1, $6.00-6.25; good quality but light weight $5.00; dark, broken sections $4.00-4.50 per case. Beeswax: Receipts moderate. Demand slow to moderate. Market about steady. Great deal of foreign wax around, mostly of inferior grade, particularly from Philippine Islands and Africa. Sales to ship supply houses, wholesale drug houses, harness makers, and laundry supply houses, per lb. Texas, Missouri, and Oklahoma, light 29-32c, dark 26-28c. South and Central American, medium light 21-24c.

MINNEAPOLIS.—Comb: Supplies liberal. Demand and movement light, market steady. Sales direct to retailers, Colorados and Utahs, 24-section cases mixed alfalfa and sweet clover No. 1, $6.25-6.50, few $7.00. Extracted: Supplies liberal. Demand and movement slow, some dealers feeling much weaker, others holding firm. Sales direct to retailers, confectioners and bakers, Colorado and Utah, white alfalfa and sweet clover mixed 12-17c per lb. Minnesota and Wisconsin, white clover 13-16c per lb.

NEW YORK.—Domestic receipts limited, foreign receipts limited. Supplies limited. Demand limited, market dull and unsettled. Extracted: Spot sales to jobbers, wholesalers, confectioners, bakers, and bottlers, domestic per lb. California, white sweet clover 9½c, light amber alfalfa 8½-9c, light amber sage 9-10c, white sage 11-12c, white orange blossom 12-13c, few high as 14c. New York, white clover 9½-10c, buckwheat 7½-8½c. South American and West Indian, refined 65-75c per gal., or 6-7c per lb. Comb: Few sales, New York, 24-section cases white clover No. 1, $6.50-7.00. Beeswax: Foreign receipts moderate. Supplies moderate. Demand limited, movement light, market dull. Spot sales to wholesalers, manufacturers, and drug trade —South American and West Indian crude light best 22-24c, slightly darker 20-21c, dark 14-15c. African, dark mostly 14c.

PHILADELPHIA.—Receipts light. 74 cases N. Y. and 21 bbls. Porto Rico reported arrived, but dealers generally have a moderate supply on hand. Demand for extracted only moderate and the market steady. Extracted: Sales to jobbers, bakers, and wholesale grocers, Porto Rico, light amber various flavors 76c per gal. New Yorks, white clover 8¼-9c. Beeswax: Altho receipts are very light the demand is slow and market slightly weaker. Sales to manufacturers per lb. crude, medium light, Chilean 22c, Brazilian 21c, African, dark 14-15c. New crop Chilean expected to be ready to move the latter part of December.

H. C. TAYLOR,
Chief of Bureau of Markets.

Special Foreign Quotations.

LIVERPOOL.—Since our last report there has been little doing in Chilian honey. Stocks are getting gradually reduced, and only about 150 barrels are now in first hands. The value in American

(Continued on page 781.)

Gleanings in Bee Culture

Index for 1921

Published by The A. I. Root Company, Medina, Ohio

Index to Gleanings in Bee Culture

Volume XLIX

In using this index the reader should not fail to note that it is divided into five departments, namely, General, Editorial, A. I. Root's writings, Contributors, and Illustrations. The index of General includes everything except Editorials, Illustrations, and A. I. Root's writings.

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The Opinions of Honey Producers Themselves as Reported to Gleanings in Bee Culture.

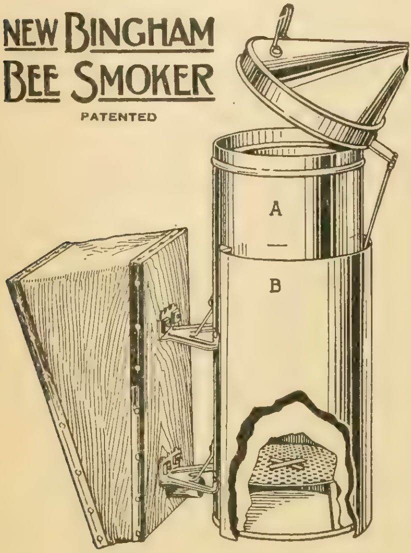
Early in November we sent to actual honey producers and to some associations the following questions:

1. What is the condition of the colonies in your locality compared with normal as to (a) Number and age of bees? b) Stores for winter? Give answer in per cent.
2. What is the number of colonies in your locality compared with spring count? Give answer in per cent.
3. What is the condition of the honey plants for next season at this time as compared with normal? Give answer in per cent.
4. What per cent of the 1921 crop of honey is still in the hands of producers in your locality?
5. What prices are producers receiving at their station when sold to large buyers? (a) Comb honper case? (b) Extracted honey per pound?
6. What is the price when sold to retailers in case lots? (a) Comb honey fancy or No. 1 per case? (b) Extracted honey in five-pound packages?
7. How is honey now moving on the market in your locality? Give answer in one word as slow, fair, rapid.
8. What per cent of the honey is being sold locally this season in your locality?

The answers as returned by our corps of honey and bee reporters are as follows:

State.	Reported by	Condition		No. Colonies.	Plants.	Crop Unsold.	In large lots.		To retailers.		Movement.	Sold Locally.
		Bees.	Stores.				Comb.	Extr.	Comb.	Extr.		
Ala.	J. C. Dickman	90	90	100	80	25		$.07			Fair	95
Ala.	J. M. Cutts	100	125	120	80	50	$4.80	.10	$6.00	$.60	Slow	90
Ariz.	K. R. Evans	110	105	100	100	10		.07			Fair	5
Ark.	J. Johnson	100	100	100	100	50			6.00	1.00	Fair	50
Ark.	J. V. Ormond	100	150	100	100	0						
B. C.	W. J. Sheppard	100	100	130	100	25	7.20	.28	10.80	1.75	Fair	99
Cal.	M. C. Richter	90	100	100		20		.06		1.15	Rapid	30
Cal.	M. A. Saylor	100	100	100	100	50	3.00	.07	3.60	.75	Fair	75
Col.	J. A. Green	100	95	120	100	25	4.70	.08	4.80	.65	Fair	10
Col.	B. W. Hopper	90	90	95	100	0	5.00	.10	6.00	.80	Rapid	10
Conn.	A. Latham	125	100	110	100	80	4.50	.17	6.00	1.50	Fair	90
Conn.	A. W. Yates	100	100	125	70	50	6.00	.15	8.00	1.00	Fair	100
Fla.	C. C. Cook	100	100	147	100	80		.15			Fair	90
Fla.	H. Hewitt	100	100	100	100	20		.08		.85	Fair	90
Fla.	W. Lamkin	100	100	105	100	25		.10		.75	Fair	50
Ga.	J. J. Wilder	100		120	100	50	5.50	.10	6.50	.85	Fair	70
Ill.	C. F. Bender	100	100	110	100	0	6.00		6.50		Good	80
Ill.	A. L. Kildow	100	100	95	110	75	5.25	.12	6.00	1.00	Fair	40
Ind.	J. Smith	100	75	125	150						Fair	100
Ind.	T. C. Johnson	100	100		125	5			6.00	1.00	Fair	100
Ind.	E. S. Miller	100	100	100	100	50			6.00	1.00	Slow	100
Iowa.	F. Coverdale	100	75	90	80						Fair	
Iowa.	W. S. Pangburn	100		100	100	75		.14		.90	Fair	25
Iowa.	E. G. Brown	100	80	110	90	25		.10		.95	Rapid	25
Kan.	C. D. Mize	100	75	110	100	40			6.00	.75	Fair	100
Kan.	J. A. Nininger	90	70	90	90	20	5.50	.12	6.00	.75	Fair	100
La.	E. C. Davis	100	100	200	100	50		.08	6.00	1.00	Fair	50
Me.	O. B. Griffin	90	95	120	90	50	6.75		7.20		Fair	50
Md.	S. J. Crocker, Jr.	100	100	125	90	10		.13	6.00	1.00	Fair	100
Mass.	O. M. Smith	100	100	100	100	10					Slow	100
Mich.	I. D. Bartlett	125	125	125	100	25		.11		.75	Fair	100
Mich.	F. Markham	100	125	110	125	25			6.00	.85	Fair	100
Mich.	L. S. Griggs	100	100	125	110	35			6.00	.90		
Minn.	C. Blaker	100	100	100	100	50	5.50	.11		1.25	Slow	60
Miss.	R. B. Willson	100	100	110	75		4.50	.09	5.00	.92	Fair	60
Mo.	J H Fisbeck	100	100	100	100					1.25	Fair	100
Mo.	J. W. Romberger			110	60	0	6.50	.12	7.00	.92	Slow	100
Mont.	R. A. Bray	100	110	110	100	40	5.50	.12	6.00	.80	Fair	30
Nev.	T. V. Damon	100	100	100	100	0	4.50		5.50	.75		0
N. J.	E. G. Carr	100	100	125		60			6.00		Fair	50
N. Y.	Adams & Myer	85	50	100	25	35	5.00	.10	6.50	1.00	Fair	75
N. Y.	G. B. Howe	105	110	95	75	10		.13		.85	Rapid	90
N. Y.	F. W. Lesser	90	100	120	90	10	4.50	.10	5.50	.88	Fair	5
N. Y.	O. J. Spohn	100	100	100	100	20					Slow	100
N. Y.	G. H. Rea	100	100	100	50	25	4.50	.09	6.50	1.10	Fair	
N. C.	C. S. Bumgarner	100	80	110	100						Slow	100
Ohio.	E. G. Baldwin	125	125	200	80	50	6.00	.10	7.00	1.00	Fair	50
Ohio.	F. Leininger	100	100		100	0		.10	5.00	.75		25
Ohio.	J. F. Moore	100	90	100	90	25		.12	4.80	.80	Fair	10
Ohio.	R. D. Hiatt	100	80	120	95	20			6.00	1.20	Fair	100
Okla.	J. Heneisen	60	80	90	75	0						
Okla.	C. F. Stiles	85	60	100	90	0					Slow	100
Ore.	E. J. Ladd	100	90	60	100	20			7.50	.50	Fair	100
Ore.	H. A. Scullen	100		125	90	25	5.75	.12	6.75	1.00	Fair	100
Pa.	H. Beaver	100	100	110	85	50	4.25	.09		.75	Fair	20
Pa.	C. N. Greene	100	90	100	90	25	6.00	.10	6.25	.75	Fair	90
R. I.	A. C. Miller	105	100		100					1.25		
S. C.	A. S. Conradi		95	100	100	25					Rapid	100
S. D.	L. A. Syverud	100	100	115	90	30			5.00	.70	Fair	50
Tenn.	J. M. Buchanan	100	100	100	90							
Tex.	T. A. Bowden	75	80	100	70	25				.80	Slow	100
Tex.	J. N. Mayes	70	80		65	5	8.00	.10	8.40	.55	Rapid	25
Tex.	H. B. Parks	98	100	115	95	20		.08		.85	Fair	33
Utah.	M. A. Gill	90	100	110	80	5	4.50	.08	5.00	.50	Fair	75
Wash.	G. W. B. Saxton	100	100	95	100	95		.12		.95	Slow	
Wash.	G. W. York	80	60	100	95	50	5.00	.09	6.00	.90	Slow	75
Wash.	W. L. Cox	100	95	85	95	0	6.00	.12	7.00	.90	Rapid	95
W. Va.	W. C. Griffith	100	100	105	100	10	7.50	.15	7.50	1.00	Fair	100
Wis.	N. E. France	100		100	110	0				1.25	Fair	95
Wis.	E. Hassinger, Jr.	100	100	110	50	10				.85	Rapid	85
Wis.	H. F. Wilson	100	100	100	100	10		.15		1.25	Rapid	100
Wyo.	A. D. Brown	100	90	105	90	65	5.00	.11	6.00	1.00	Fair	90

Bingham's Big Smoke Smoker



Wins Contest at New York State Beekeepers' July Meeting.

Gilbertsville, N. Y., Oct. 3rd, 1921.

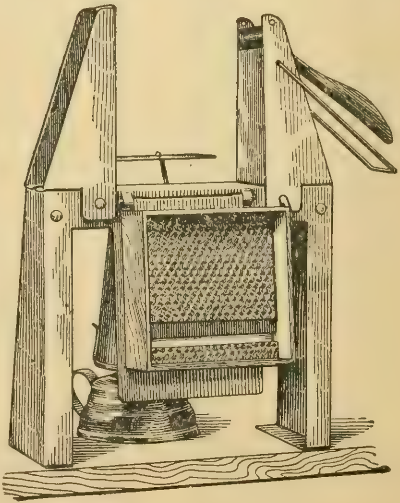
A. G. Woodman Co.:

Last winter I bought a copper Big Smoke Smoker with shield of you and in July took the same to the Chenango County beekeepers' picnic and entered the Smoker contest. There were nine contestants and the Big Smoke won the prize, which was a fine queen bee. Needless to say, I was very proud of the victory. They gave us one minute, and at the expiration of thirty-five minutes the Big Smoke was the only one burning. They called it ''Steam Boiler.'' However, it won and thought I would inform you. C. F. Bushnell.

The contestants were allowed to use any fuel they desired and as much or as little of it as thought advisable. The contestants were given one minute in which to light their smokers, then let set for thirty minutes. At the end of this period, the one that smoked best in thirty seconds won the prize.

Buy Woodman Section Fixer

One of our men, with the Section Fixer, puts up 500 sections with top starters, in one hour and thirty minutes, 500 sections set up with top starters in ninety minutes. This includes the labor of cutting foundation, getting sections and supers and placing the sections into the supers and carrying them away. A complete job. This is nothing unusual, but his regular speed. You can do the same if you have the push after you become accustomed to the work. There is no breakage of sections. It will pay you to secure one of these machines for this work. It is the best thing of the kind on the market.



Special Sale on Honey Packages

Friction-top Pails in the 5-pound at $7.00 per crate of 100; $13.00 for crates of 203; the 10-pound size at $11.30 for crates of 113. Special prices on 60-pound cans, one-gallon square cans, and other sizes.

A. G. WOODMAN CO., Grand Rapids, Michigan

QUEENS Package Bees and Nuclei QUEENS

Have a special offer to Beekeepers' Associations or groups of beekeepers that can use a car of bees at a time, 800 to 1000 packages. We are prepared to load 2 cars a week after April 5th, 1922. Free ticket to the party coming down to go back with the car or I can furnish a man. This is the best way; no transferring from one car to another; bees go through in 3 to 4 days. Also special attention given to small orders.

1922 PRICES. BOOKING ORDERS NOW. SAFE ARRIVAL GUARANTEED.

1-pound package	$2.25 each;	25 or more	$2.15 each
2-pound package	3.75 each;	25 or more	3.60 each
3-pound package	5.25 each;	25 or more	5.00 each
2-comb nuclei	3.75 each;	3-comb nuclei	5.25 each

(Add price of queen wanted.)

1 Untested Queen	$1.50 each;	25 or more	$1.30 each
1 Select Untested	1.70 each;	25 or more	1.50 each
1 Tested	2.25 each;	25 or more	2.00 each
1 Select Tested	2.65 each;	25 or more	2.25 each

One-fifth down with order, balance just before shipping; or 4% discount for full remittance for December, and 3% for January orders.

THE NUECES COUNTY APIARIES, CALALLEN, TEXAS

E. B. AULT, PROP.

The Old Reliable Three-Banded Italians

Booking Orders Now for 1922. Queens Ready April 1.

Read the Following Letter:

Next season I will want more of your Italian Queens as I am very well pleased with the ones that I have gotten from you.

One of the reasons I want your queens is because I saw just how you rear your queens when I visited your apiaries in the spring of 1920. As I have been a queen-breeder I feel that I know how the best queens should be reared. I feel that I can truthfully say that you have the best and most complete outfit for queen-rearing that I have ever seen. Your plan of selecting only the large well-built cells to give to your mating nuclei also took my fancy. I saw colonies that were headed by your breeders with about two hundred pounds of honey in the supers. I was so favorably impressed that I gave you that year's order for queens.

Your queens have made good here, produced some very strong colonies that got the honey. I have used several of them for breeders and so has one of my friends, whom I let have a few of your queens. He thinks they are the best queens that he ever bought. I take every opportunity to recommend your queens to my beekeeper friends.—C. S. Engle, Sioux City, Iowa.

Nearly every beekeeper who has visited our apiaries has become a customer. There must be a reason.

Prices April, May, and June.

Untested	$1.25 each;	25 or more, $1.00 each
Select Untested	1.50 each;	25 or more, 1.25 each
Tested	2.50 each;	25 or more, 2.25 each
Select Tested	3.00 each	

JOHN G. MILLER

723 C STREET, CORPUS CHRISTI, TEXAS.

Lynchburg and "Beeware"

WVA
KY.
LYNCHBURG
N.C.
S.C.
GA
FLA

FOR THE BENEFIT of beekeepers in the Southeast and to answer an ever increasing demand from the beekeepers of that territory, the branch of the G. B. Lewis Company has been moved from Lawyers to Lynchburg, Virginia.

Lewis workmanship, "Beeware" quality, and Lynchburg shipment will be three of a kind. Call and see us at Thirteenth and Commerce Streets, Lynchburg, Virginia.

BEE HIVES AND APIARIAN EQUIPMENT
BEWARE
WHERE YOU BUY YOUR
BEEWARE
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WATERTOWN
USA
MAKES THE FINEST.
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GLEANINGS IN BEE CULTURE

DECEMBER, 1921

EDITORIAL

Drifting When Large Winter Case Is Used.

NOW that the quadruple winter case has been adopted as standard equipment by many northern beekeepers, it is well to take some precautions to prevent drifting when these large winter cases are used. The hives should not be moved very far from their summer position when they are put into the winter case, so the bees will not be so badly confused on their first flight after being packed. Many beekeepers use the bottom of the winter packing case for the hive-stand during the summer, the hives being spread apart as far as they will go on the bottom of the winter case in summer, and crowded together for winter. If there is any trouble from bees entering the wrong hive, it can be overcome to a great extent by driving a stake into the ground just between the two entrances, or by any arrangement that will help the bees to distinguish their own entrance. The type of entrances used in the winter case apparently makes considerable difference in the tendency to drift.

* * *

Don't Winter American Foul Brood.

BEEKEEPERS who are located where there is much American foul brood can save themselves a lot of trouble next spring by a little attention now to see that no colonies having this disease are permitted to go into winter quarters in their neighborhood. Any colonies that have been greatly weakened by American foul brood should be destroyed, for it would not pay to treat weak colonies having mostly old bees. No doubt thousands of such colonies will be permitted to go into the winter again this year thru carelessness and ignorance, only to die in midwinter. Then as soon as the bees can fly they will rob out the honey that is left and the disease is scattered to other colonies. Next spring the inspector may find these hives and burn up the infected combs; but it is then too late, for the mischief is usually done before the inspector can begin his regular work of examining colonies for disease in the spring. Colonies which are found to be only slightly diseased can be treated now, wherever brood-rearing has entirely ceased, by shaking them on combs of sealed honey and destroying the combs from which they were shaken.

* * *

Beekeeping Projects at Experiment Stations.

OF THE more than 4,000 projects being investigated by the various agricultural experiment stations in this country, 356 relate to studies on various insects, and 35 of these relate to bees and beekeeping. It will be of interest to beekeepers to know that more projects relating to honeybees are listed than are listed relating to any other insect, apple insects (all species) being covered by 20 projects, of which the coddling moth calls for 13. This is a most creditable showing for beekeeping and is quite in contrast with conditions of a few years ago. The beekeeping projects are conducted at 13 experiment stations, and there are five others where some work is reported from other sources.

* * *

Selling Honey at Public Sale.

A BEEKEEPER in northern Indiana has sold large quantities of honey this fall at public sales held in his vicinity. While he has not explained his method of selling, apparently some of the honey is sold at auction to the highest bidder, probably just enough to create an interest and call attention to the supply he has brought with him, which is then sold at the regular price to all who wish to buy. No doubt, an arrangement of this kind can be made at almost any public sale, thus offering an opportunity to dispose of tons of honey to people who probably would never think of using honey if it had not been brought to their attention in this way. This beekeeper is building up a trade in honey that should be of great value to him in the future. He did not cease his effort when his own crop was sold, but he has sold the crop of some of his neighbors, thus contributing to the general good of the beekeeping industry.

* * *

Government Market Reports on Honey.

THE Bureau of Markets and Crop Estimates, U. S. Department of Agriculture, is constantly improving its service to beekeepers in information on the honey markets. In its semi-monthly reports, which are sent free to beekeepers and others, are given not only shipping point information and telegraphic reports from important markets, as published on the market page in this journal, but additional information on imports and exports of honey and beeswax are also given out from time to time. These semi-monthly reports can be had for the asking by writing to the Bureau of Markets and Crop Estimates, U. S. Department of Agriculture, Washington, D. C., asking for the semi-monthly report on honey.

* * *

What They Have Done For Us.

OUR market reporters, who have so faithfully reported the crop and market conditions for their respective localities each month for our market page, certainly deserve a vote of thanks from our readers for the service they have rendered beekeepers during this season when this kind of service was so badly needed. No one can tell what would have happened to the honey market, if the information on crop and market conditions gathered and published by the bee journals and the U. S. Bureau of Markets and Crop Estimates had been withheld. In some regions a bumper crop was harvested this year following a similar bumper crop harvested last year, much of which was still in the hands of the producers. This condition would have caused panicky selling in these localities, if the true conditions existing thruout the country had not been known early in the season.

One correspondent complains that the publication of the crop and market conditions for his locality, where the crop was light this season, caused his market to be flooded with honey shipped in from other places at prices below that which he could have obtained if the foreign honey had not appeared in his market. This man failed to consider how much cheaper this same honey from outside sources would have been dumped upon his market, if the honey market had not been steadied last summer by the publication of the true condition of the crop and the markets in all important centers.

* * *

Extension Work in Beekeeping in New York.

GEO. H. REA, who during the past few years has been doing beekeeping extension work in the State of New York under a co-operative arrangement between the Bureau of Entomology, U. S. Department of Agriculture and the New York State College of Agriculture, is leaving to take up similar work in Pennsylvania. Few people fully realize the far-reaching effects of vigorous extension work, such as has been carried on in New York during the past several years, and the betterment of beekeeping that must result from this kind of work. Within the past year Mr. Rea held 55 demonstrations with an attendance of nearly 1000 beekeepers, gave 65 lectures with an attendance of about 2500, and attended 36 conventions with an attendance of 1603. This makes a total of 156 meetings, with a total attendance of 5170 beekeepers. He also visited 66 apiaries to give personal assistance. In addition to this, the correspondence on beekeeping was over 1000 letters.

Since Mr. Rea went to New York the number of associations (county and regional) has been increased to 37, with a membership of 1500. During the season of 1921 the associations co-operated in the purchase of supplies amounting to about $20,000, which means a considerable saving in purchase price and a reduction in shipping expenses. Many of the new organizations have affiliated with the State Association.

* * *

The Silver Lining Grows Brighter.

THE energy with which beekeepers have taken up the problem of creating new outlets in disposing of their crop of honey this season is having its effect, and in some places the stocks of honey are being cleaned up nicely in spite of the general depressed condition of business.

As pointed out editorially last month, the most important feature of the intense selling campaign put on by beekeepers thruout the country this season is, after all, a much greater thing than the disposal of this season's crop and that which was held over from last year, important as this is. The rewards for this extra effort will come in the future, and in his effort toward creating new outlets for honey the beekeeper should think in terms of building for the future. Every pound of honey that is sold to some one who has not been a user of honey should call for more than a pound next year as well as for many years to come when, no doubt, production and distribution costs, as well as the price of honey, will become adjusted to leave more profit to the producer.

A year ago it began to look as tho the good effects of the introduction of honey during the war into thousands of homes where it had not been used before would be lost, but apparently many who learned to use honey when sugar was so difficult to obtain, are willing to use it regularly when it can be obtained at a reasonable price. If the present intensive selling effort is continued a few more years, there is no telling how much honey will be consumed by the American people.

Those who have made a lot of new customers for honey but have sold out their crops should by all means secure enough honey elsewhere to supply this newly created demand, or at least see that it is supplied by someone, for every possible channel for the movement of honey should be kept open for a possible good crop next year and other years to come. A constant and vigorous effort on the part of all the agencies now at work in the distribution of honey is the only way the gains now being made will become permanent.

More evidence is coming to the editor's desk every day indicating a growing popularity of the 5-pound pail as a standard package for honey. Let us hope that the time is not far distant when this package will be as well known to the American housewife as standard packages of other food products now so familiar to the American people and so commonly found on the grocer's shelves.

* * *

Some Plans for Gleanings in 1922.

WITH the lower prices for honey now prevailing and which may prevail for some time to come, beekeepers must figure closely to make their business show a profit. No doubt some of the honey now being marketed is being sold for even less than it has cost to produce it when all the factors that enter into its cost are figured, especially in those localities where the crop was light.

Obviously, unless the price of honey can be increased, the only way left open for the beekeeper to increase his profit is by reducing his operating expenses or increasing his yield, or better still by doing both. In many cases, probably in most cases, there is abundant room for increasing the now too narrow margin of profit in both these directions, but especially in the matter of increasing the yield.

To meet the situation as it exists today Gleanings has plans under way for publishing, during 1922, specific seasonable articles from the best authorities in the country, giving their latest short cuts in production and their best methods for increasing the yield.

During the spring we expect to publish the very latest and best ideas from some of the most successful beekeepers in the country on spring management, telling how to have the largest possible force of bees in each hive at the very beginning of the honey flow instead of in the middle or at the close of the honey flow, as too often happen in many of the colonies. Much has been learned about this important problem within recent years, and Gleanings proposes to publish the best matter obtainable on this subject just when the need for this information is greatest in the spring.

In the May issue, the problem of swarm control will be discussed by beekeepers who have been most successful in dealing with this difficult problem, telling how to hold down swarming with the least possible labor, and at the same time to keep the spirit for work among the bees at the highest pitch thruout the entire period of the honey flow.

In July and August we expect to publish the latest short cuts in harvesting the crop of honey and packing it for market, both for comb honey and extracted honey. The September issue will be devoted largely to the problem of marketing; the October issue to outdoor wintering, and the November issue to cellar wintering, giving in each case the very latest information on each of these subjects from experts in their particular line. These are a few of the outstanding features now under way for Gleanings for 1922.

In addition to these special features for the more extensive honey-producers, the needs of the amateurs and beginners will be conscientiously taken care of in the departments, Talks to Beginners and Gleaned by Asking, but in every case the matter will be selected and arranged with the thought constantly in mind of making the special feature articles of benefit to the beginner as well as the extensive honey-producer, and the Talks to Beginners and Gleaned by Asking departments useful not only to beginners but also to professional beekeepers. The other departments in Gleanings are to be continued and strengthened. The North, East, West, and South department is being modified, so that it will be more useful to beekeepers everywhere. Our market report service will be strengthened and made of more value to beekeepers than ever before. Grace Allen and Constance Root Boyden will continue their delight contributions for the many who enjoy them.

J. E. Crane, with his rich and ripe experience in beekeeping, will continue his valuable monthly comments on the preceding issue.

A. I. Root, still young despite his 81 years and as much interested in all affairs of life as ever, will of course continue his unique ''Our Homes.''

AN APIARY 7900 FEET UP

Secured From 100 Bee Trees. Rocky Mountain Bee Plant Heavy Yielder in Its Natural Home

By S. M. Campbell

I GOT my start in bees in 1920 by finding 54 bee-trees. I had good luck in saving them, for I always worked into the frames the combs of brood and all the straight comb. I found the bees in all kinds of trees as well as in logs lying on the ground. From one log I got over $20.00 worth of honey besides the full set of 10 combs. I got plenty of honey to pay my grocery bill all the summer of 1920 from the wild bees.

This spring, 1921, I commenced early hunting for more bee-trees and have found up to date 46. The best tree had five 5-gallon cans full of comb

[The beeyard that has an elevation of 7900 feet on Eldern Mountain. There are 46 colonies here, all taken from bee-trees. The best colony made over 200 pounds of comb honey from the Rocky Mountain bee plant. In winter this high-up apiary is sometimes buried under six feet of snow. This is the location on which Mr. Campbell began bunching his wild bees.]

honey. I don't think anyone has worked harder than I have to get into the bee business. I worked a strip last summer 13 miles long and six miles wide in the rough mountains. Some of them are so high that they have snow on top all summer. I didn't have a team or a car, so I had to carry the bees on my back from the mountain to my Mount Eldern Apiary. But I have something to be proud of now, for I have something that makes me a living.

The bees are mostly hybrids, but there

[The Campbell apiary on its winter location at the foot and on the south side of the lofty Eldern Mountain. Winter cases will be put on these hives. These are made an inch larger than the hive on the inside and deep enough so that the super can be left on and a top covering of 6 inches of chaff given.]

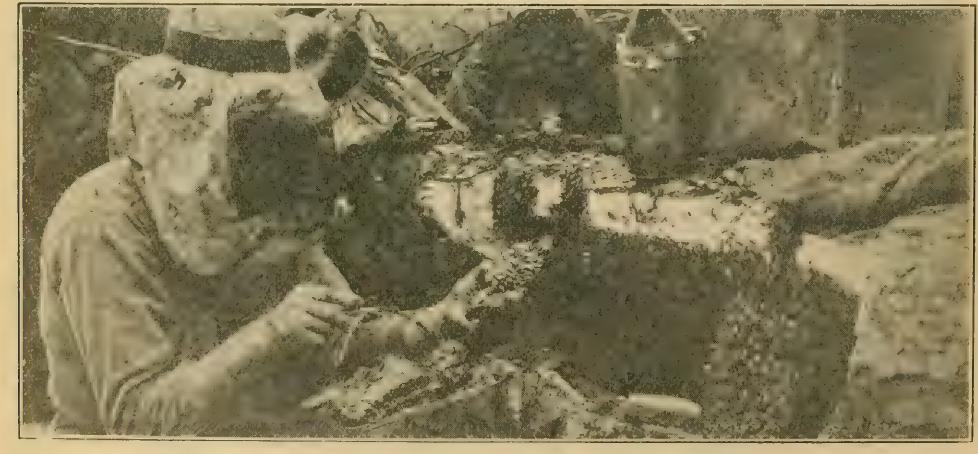
[Mr. Campbell took swarms of bees from this one tree from openings 60 feet above the ground. He secured 80 pounds of honey and 16 frames of comb filled with brood and honey. The 100 bee-trees felled by Mr. Campbell were all cut with the ax shown in the picture.]

are quite a few pure blacks, the blacks having made the most honey. The colony that made over 200 pounds of honey is black bees. I got them out of a gabled end of a house in Flagstaff. They had been there eight years.

I have never seen any honey that beats this, gathered from the Rocky Mountain bee plant. The picture of this honey plant which I am sending you was taken close to the beeyard. The plant grows about three feet high. It makes good hay when cut at the right time, and the chickens like the seed as well as they do buckwheat. My

[This bee-tree was one of seven standing very close together at an altitude of over 7000 feet. The opening in this tree was only shoulder high to Mr. Campbell, who is shown smoker in hand ready to do business. Seven bee-trees bunched close together show what excellent bee pasture the Rocky Mountain bee plant furnishes in its native place.]

[A patch of Rocky Mountain bee plant, growing wild about Mr. Campbell's apiaries. "A wonderful honey," says Mr. Campbell, "in the blooming of which the nectar fairly shines."]



[Mr. Campbell called this a rich bee-tree. The picture shows little more of the big pine log than just the opening into it made with Mr. C.'s ax. He is here shown securing a big lot of honey which more than filled two five-gallon cans, the top of one of which is shown directly in front of the busy honey harvester. The bees' entrance in this tree was 50 feet above the ground.]

little Ford is standing in the corner loaded with supers.

Flagstaff, Ariz.

[The Rocky Mountain bee plant (*Cleome Serrulata*) was tried out by beekeepers thruout the country years ago in an effort to cultivate it as a honey plant. In 1891 the Michigan Experiment Station planted several acres of it for the sole purpose of testing its honey-producing qualities, but the results were disappointing so far as nectar was concerned. This, of course, is only one of many illustrations of a nectar-bearing plant being of minor importance outside of its natural environment but a dependable source of large crops of honey when growing in its natural home. Apparently this plant is a heavy yielder of nectar at greater altitudes. The finding of so many bee-trees more than 7,000 feet above the sea, is an indication of the importance of this plant as a yielder of nectar in its native home.—Editor.]

PACKAGE BEES FOR THE NORTH

Building Up a Great Industry in the South. A Good Use for Bitterweed Honey

By E. R. Root

A COUPLE of months ago, after I had visited central Alabama and had noted the wonderful opportunities for bee-raising and queen-rearing in that part of the country, a statement came out in one of the Montgomery papers that this particular country was so good that 10,000 beekeepers would come into Montgomery County alone.

As it transpired, this was the innocent prophecy of an enthusiastic booster from Montgomery and vicinity, and not the statement authorized by any beekeeper, much less by myself. The real honest facts of the case are these: The territory in question is not a great *honey* country. The average yield per colony is not large as compared with those of the North; but there is an almost continuous light flow from month to month, possibly eight or nine months of the year—just such a flow as is ideal for the production of bees and queens. It is my belief, from what I have seen from two trips in that country, that the territory within 200 miles of Montgomery, Ala., while mediocre for the production of honey, is the best for raising bees and queens for the North of any equal area in the United States unless it be the alluvial lands in central and southern Louisiana. Of this I shall speak more at length at another time.

Bitterweed.

As a matter of fact, if the figures I have gathered are correct, and I think they are, there are actually more bees raised and queens reared in central Alabama and eastern Mississippi than in any other equal area in the world. Quite a number of the queen-breeders in the territory reared and delivered over 8,000 queens this last season. Two or three reached the 10,000 mark; and one in particular actually raised and sold over 15,000 queens; and he said that, if he had had the orders, he could easily have made it 20,000.

Buying Package Bees in Spring Instead of Wintering in North.

The honey comes in just fast enough to keep up breeding, and by the first of April the hives will be boiling over with bees. The surplus of these bees is shipped north in packages holding from two to three pounds each. Scores and scores of instances will show where these three pounds of bees, when shipped and put on combs in the North, have made a production of honey equal to any of those wintered over in the cellar or outdoors. Large numbers of extensive honey-producers in the North are already beginning to raise the question why they can not buy their bees in package form from this Southland cheaper than they can winter over in cellars or packing-cases, using honey that they might otherwise sell, and the proceeds from which they could use for buying bees from the South with absolutely no possibility of winter loss. There are, I believe, not a few who would winter only a part of their bees if they could be sure of getting delivery from the South of all the bees they need by the 15th of April or May 1.

The beekeepers of the Southland, seeing their opportunity to supply their northern colaborers with bees and queens, are rapidly increasing their facilities for raising them. They are by no means anxious to have other people come in and flood a territory well nigh overstocked with bees; moreover, any northern man who would go down into this country would have to spend a year or two before he could become fully acquainted with the territory. There is just as good bee-raising territory elsewhere in the Black Belt as in the section near Montgomery, now overcrowded. There is, likewise, good territory in Louisiana where there are few bees and beekeepers. Of this I shall write later.

Bitterweed a Blessing in Disguise.

There is one honey plant much despised in some quarters, but which is a very important factor in the production of bees and queens in the South. It is known as the bitterweed, and, as might be expected, the honey is very bitter, and, of course, entirely unfitted for table use—so poor that even the manufacturers do not want it. The natural consequence is that this honey, entirely suited for breeding bees, stays in the hives. It is this poor honey that makes such strong colonies in the spring.

Besides the bitterweed there are other honey plants such as boneset, goldenrod, and willow that yield inferior honeys that help to keep up a rotation of a continuous flow for almost the entire year.

But the beekeepers of this Southland, besides their dark and inferior honeys, secure a very fair surplus of a splendid honey known as melilotus, or sweet clover, some of it being the annual, or Hubam. This lasts several weeks, and, best of all, it comes on at a time after the main shipping of the bees in package form. While the yield is fair, the average per colony is only about a half of the average production in the North. The quality is equal to that of any sweet-clover honey in the North.

In a future issue I hope to tell you about another land that is the equal if not the superior of the famous Black Belt of Alabama and Mississippi. There are comparatively few bees and beekeepers there yet; and when they do get into this land of promise it may rival any other territory in the United States for raising bees and queens.

RAPID FOUNDATION FASTENER

Fifteen Hundred Sheets of Foundation per Hour Fastened in Sections by One Person

By Geo. S. Demuth

DURING the past 15 years the inventive genius of American beekeepers has been busy with improvements in methods and apparatus for producing extracted honey, leaving those of us who have continued to produce comb honey to get along with the comb-honey appliances that had been developed up to that time. The recent improvements in honey-extractors, uncapping-knives, and methods for handling the honey from the time it is taken from the hives until it is in the cans ready for shipment have given to the producer of extracted honey a great advantage over the producer of comb honey in handling large quantities of honey. While machinery is helping out in the production of extracted honey, comb-honey production is still done to a large extent by hand.

Among the time-consuming processes in comb-honey production are the preparation of the supers before being given to the bees and the scraping, grading, and packing of the finished honey, nearly all of this work being done by hand.

Fortunately before so many potential inventors deserted the ranks of comb-honey producers to take up the production of extracted honey some excellent machines were devised for folding sections and fastening foundation in them accurately and rapidly, the Rauchfuss combined section press and foundation-fastener and the Root section-press and steam foundation-fastener being among the "last words" in machines for this purpose. With either of these machines the work of folding sections and fastening foundation can be done neatly and rapidly, apparently leaving but little to be desired in apparatus for this kind of work, but when hundreds of supers must be prepared the time required, even with the most rapid combined press, is no small item.

Described in 1893 but Dropped Out of Sight.

Back in 1893, long before the hot-plate machines were really perfected as we now know them, R. L. Taylor described in the Beekeepers' Review a simple device which he was using for fastening foundation in sections. It had been described editorially in that magazine five years previously, and it is mentioned but not described in Cook's Manual of the Apiary. No one except Taylor seemed to be much interested in the device, and it dropped out of sight entirely, altho a somewhat similar but less efficient device has been used by certain comb-honey producers for years.

In regard to the speed of fastening foundation with this device Mr. Taylor wrote as follows: "With two or more boards and sufficient help to put on and take off the sections, one person may fill 1500 sections per hour and the foundation is fastened in such a manner as to leave nothing to be desired in that respect." Perhaps many who read this article thought, as I did, that the printer must have made a mistake in setting up these figures, adding an extra cipher on the end. Fifteen hundred sections per hour seemed to be entirely too great a claim for such a simple apparatus when 200 per hour is about all a good operator could expect to do when using any of the ordinary hot-plate machines, tho by using a combined machine, sections can be folded and the foundation fastened in them at the rate of about 200 sections per hour. The figures given by Mr. Taylor were for fastening the foundation only, the folding and handling of the sections, as well as handling the foundation, being done by helpers.

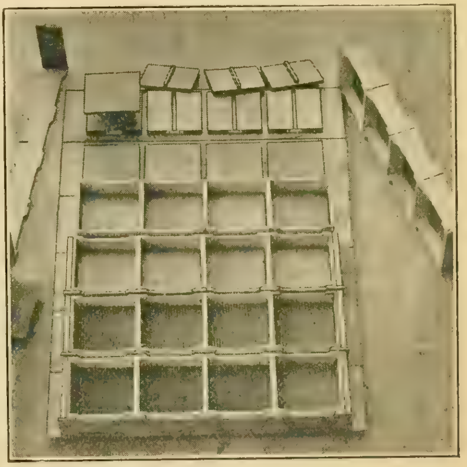
Statement Stood Unchallenged 28 Years.

Every time I have run across this article in looking up references in this particular volume of the Beekeepers' Review the statement that one man could fasten sheets of foundation in sections at the rate of 1500 per hour has stood out as a sort of challenge, but partly on the supposition that there was an error in the figures I did not build an apparatus to test it out until last spring. The one I built improved on the device described by Taylor, to adapt it to present-day construction of comb-honey supers, the modification fortunately making much greater speed possible in putting the sections into the supers, since they are handled in groups of four instead of individually.

The device was tried out in putting up the sections for this season's crop in my own apiaries, and I was greatly surprised to find that without previous experience one person can easily fasten foundation in the sections neatly and securely at the rate of 1500 an hour without any special effort to attain speed; but, as stated above, this does not include folding the sections and putting them into the supers nor the handling of the foundation. The actual fastening of the foundation, after all, takes much less time than folding the sections, putting them into the supers and piling the supers away. This foundation-fastener worked out so well in this season's test that it well deserves a description of its construction and operation in this journal.

How It Is Constructed.

The apparatus consists of a series of blocks mounted on a board, the number of blocks being not less than the number of sections required to fill a comb-honey super. The lower portion or base of each block for the 4¼ x 4¼ x 1⅞ sections is 3⅞ inches across the grain of the wood, 3⅝ inches with the grain of the wood, and about ½ inch in thickness. On the upper side of each block is a groove ¼ x ¼ inch, running with the grain of the wood in the middle of the block. Another block 3⅞ x 3⅝ x ¼ inch has nailed to the lower side a piece ¼ x ¼ inch by 3⅜ inches, this small piece being nailed in the middle of the block to correspond with the groove in the lower block into which it fits loosely. When the upper block is in place it becomes a sliding platform, the ¼ x ¼-inch piece on the under side of the upper block sliding in the groove in the lower block as a guide. Small pieces of tin ¼ x ½ inch nailed across the grooves at the ends of the lower blocks act as stops so that the sliding platform can be moved back and forth only ¼ inch, the ¼ x ¼-inch guide being ¼ inch shorter than the block.



The blocks, each with its sliding platform, are mounted on a board in a horizontal position, so that the section-holders can be slipped in place over the rows of sections. Three of the sliding platforms in the farther row are turned over to show the construction.

These blocks are mounted on a board, four in a row, the grooves for the sliding platforms being crosswise of the row. Six such rows are needed for supers for 8-frame hives, seven for supers for 10-frame hives when 4¼ x 4¼ sections are used, and eight rows when 4 x 5 x 1⅜ sections are used in supers for 10-frame hives. The blocks are so spaced in each row that when the sections are dropped in place over them, they will touch each other, and the section-holder or wide frame, whichever is used, can be slipped in place over the four sections in each row. The apparatus shown in the illustration was made up by fastening each row of four blocks to a separate board, the six boards being in turn nailed to two cleats running in the opposite direction under the ends of the boards, thus making up a board to hold enough sections for a comb-honey super for the 8-frame hive. This rack should be placed on a table or bench at a convenient height so one operator can work on each side of it.

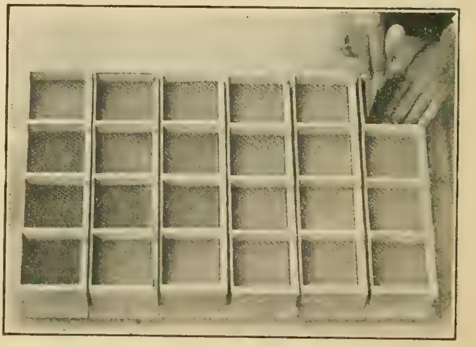
How the Fastener Is Operated.

To work to best advantage when a single rack is used, one person should fold the sections on a folding machine dropping them as they are folded over the blocks on the rack, then drop the sheets of foundation in place; while the other person working on the opposite side of the board slips the section-holders or the wide frames in place over the rows of sections, fastens the foundation, puts the section-holders with the sections into the supers, and piles the filled supers away. This usually leaves a little extra time for the one who fastens the foundation, which can be used in helping to drop the sheets of foundation in place. A better way is to have two racks, one on each side of the operator who is folding the sections, so that this operator does not need to stop while the other person fastens the foundation and clears the rack ready for more sections.

When the sections, section-holders or wide frames, and the sheets of foundation are all in place, each frame of sections is first pushed in the direction of the bottom-bar to crowd each of the sliding platforms in line with the blocks upon which they slide, then back in the opposite direction to crowd the sheets of foundation against the bottom-bars of the sections. The bottom-bars of the sections are now snug against the blocks, and the sliding platforms are all pushed back even with the lower blocks. This leaves a space a little over ¼ inch between the blocks and the top-bars of the sections, and the sheets of foundation project beyond the sliding platforms and nearly touch the top-bars of the sections. Each frame of sections is then pushed endwise as far as it will go, then back part way, and finally back again in the first direction about 1-16 of an inch to make the sheets of foundation clear the sides of the sections. These lining-up movements could be done for all the frames at once if the rows of blocks are so spaced that the frames touch each other so they can be moved *en masse.*

With an ordinary paper-hanger's scraping knife with a four-inch blade, that has been heated "smoking hot" over the flame of a gasoline stove or a large alcohol lamp, the foundation can be fastened in all of the sections on the board quickly and neatly before the knife needs to be reheated. In doing this the operator stands on the side of the bench that will put his right hand toward the top-bars of the sections. The knife is inserted between the edge of the sheet of foundation and the top-bar of the section so that its lower edge touches the wood of the section, but the handle is inclined away from the top-bar of the section. The foundation is then pushed against it with the middle fingers of the left hand while the thumb and little finger rest upon the edge of the section. When the knife is hot enough a mere touch is sufficient, the knife being withdrawn immediately and the sheet of foundation pushed firmly against the section. The sliding platform moves with the sheet of foundation. thus preventing any twisting motion of the sheet of foundation, which would cause the lower corners to bind against the sides of the section. It requires only 40 to 50 seconds to fasten the foundation in 24 to 28 sections in this way. When the last row is finished the knife is put back over the flame, and the frames of sections are put directly into the supers beginning with the one in which the foundation was fastened first, which by this time is cool enough to take off.

Each sheet of foundation now swings free from the sides of the section, there being no binding to cause the foundation to buckle, as is often the case when the foundation is fastened in the sections before they are put into the section-holders. When the section-holders or wide frames are taken out of the super to put them over the rows of sections on the fastener, each separator or fence is permitted to fall over on its side, leaving its lower edge where it was before removing the section-holder or wide frame. When the section-holders or wide frames filled with sections are put back into the supers, each separator or fence needs only to be stood up again, its lower edge not having been moved from the position it occupies when the super is filled. By standing up each of the separators with one hand while the frame of sections is being brought into place with the other hand, the sections can be put into the supers quite rapidly.

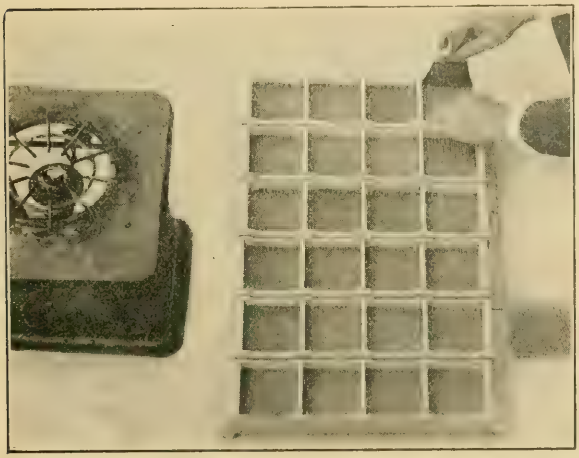


The knife is held at a slight angle from perpendicular, with the lower edge of the blade touching the wood of the section.

One Person Fills 100 Supers Per Day.

While two persons can put up sections in this way to better advantage than one I found that, working alone, I could fold the sections, fasten the foundation, and put the frames of sections into the supers at about the same rate that sections handled individually can be put into the supers after they have been folded and filled with foundation by another on a combined machine. The reason for this is that the sections are handled individually only once (as they are folded and dropped in place over the blocks), the greater speed in the actual work of fastening the foundation, and the fact that the sheets of foundation all swing clear of the sides of the sections, none of them binding and needing the edges melted off with a hot knife to prevent buckling.

Working alone I found with this apparatus I could fill 100 supers, each holding 24 sections, in 10 hours. This includes folding the sections, fastening the foundation, putting the sections into the supers, and piling the filled supers away. With one helper to fold the sections and drop the sheets of foundation in place, it was much easier to put up 200 supers in 10 hours than to put up 100 when working alone. This is twice as many as two of us have ever been able to put up in the same time when using any other foundation-fastener. With several boards and enough help so that one person could fasten foundation continuously, not having to stop to put them into the supers, handle any foundation, or pile the supers away as they are filled, one person can easily fasten the foundation in 1500 sections per hour. In this case it is necessary to have two irons, one on the flame while the other is in use. In fact, I found that I could fasten the foundation at the rate of over 2000 per hour for short periods.



The foundation is pushed squarely against the hot knife, which is instantly withdrawn, while the melted edge of the foundation is pushed against the wood, the sliding platform moving with the foundation.

This, of course, was fastening the foundation only, the folding and handling of the sections, as well as dropping the sheets of foundation in place, being done by others.

There is no wasting of wax when the fastening is properly done, the melted wax on the edge of the knife being wiped off on the edge of the sheet of foundation if the knife is withdrawn immediately after touching the wax each time. After a season's use there was not a drop of wax to be found on the fastener anywhere. Supers were hauled to the out-apiaries, many of them being stood on end in the load, and there was no trouble from foundation dropping out.

If a bottom-starter is needed, the full sheet of foundation can first be fastened to the bottom-board of the section, then cut where desired, and the larger sheet fastened to the top-bar of the section. Some method for cutting off the bottom-starter while the sheet is in place can, no doubt, be worked out by which all four sheets in each frame can be cut at one operation. When this is done the lining-up movement of the frames would need to be such that the foundation projects beyond the sliding platform at both top and bottom. It is not necessary to touch the foundation to line up the sheets, this being done for all the sheets at once, by moving the frames. In our locality bottom-starters are of no advantage when this method is used.

Some may ask why such speed is desirable in putting up sections, since the apparatus for fastening foundation is in use but a few days in the year, but since as much can be done in one day with this device as in two days by other methods, one day out of two is saved and can be used in doing something else. If it requires 10 days by the old method to put up enough sections to hold the season's crop, and five days by this method, there is a clear gain of five days in the season's work, which in my own case happens to be one-sixth of the time I have been able to devote to my apiaries each year. Again, instead of putting up sections far in advance of the time they are needed, the sections and foundation can be taken fresh from the boxes and put up as the bees need them. Knowing that two persons can prepare 200 supers for the bees in 10 hours, there is no reason for worrying about giving the room fast enough.

Now if some one will devise some simple apparatus which will enable us to scrape, grade, and pack twice as many cases of comb honey per day as is now possible, the handling of comb honey will no longer be burdensome.

OVERSTOCKING A LOCATION

When Good Yields From Large Apiaries May be Expected. Why Locations Change

By E. F. Atwater

FRANK COVDALE'S excellent and thought-inspiring article in regard to the size of apiaries, on page 403 of Gleanings for July, 1920, serves to call attention to one of the most important questions connected with commercial honey-production. I believe, with Mr. Coverdale, that we all too often underestimate the honey-producing powers of our apiary locations.

C. A. Hatch of Wisconsin told many years ago, how he had decided that 100 colonies would be the best number in one of his apiaries; but later a competitor located as large a yard within a very short distance, and yet there was no material reduction of the yield per colony. Such instances have occurred in the experiences of very many extensive producers.

Some Former Large Apiaries Now Greatly Reduced.

From about 1904 to 1910 or later Geo. E. Dudley and his brother, H. C. Dudley, kept from 200 to 400 colonies, operated for comb honey, in one location near Middleton, Ida., and secured good crops; but, during recent years, many less bees in the same locality usually produce far less honey per colony, owing to a reduction of the acreage of alfalfa, and the cutting up of the large ranches into small farms which are probably more efficiently farmed, the alfalfa not being allowed to bloom so much as formerly.

Near Arcadia, Ore., some years ago, W. H. Pennington operated a single large apiary for many years, having from 300 to 500 colonies in one yard, and some of his yields were phenomenal, but changes have taken place and now the location is a poor one. Before selling his business, Mr. Pennington increased the number of his colonies but kept them in small apiaries of perhaps 100 colonies or less.

Near Payette, Ida., R. D. Bradshaw for several years operated a large apiary of 300 to 600 colonies; but, owing to the increased number of apiaries in the locality, as well as the smaller fields of alfalfa, his apiaries are now of moderate size.

Some years ago one of my apiaries of 180, spring count, was increased to 260 colonies, and produced over two-thirds of a carload of honey. This apiary was then gradually increased to a final limit of 540 colonies, but never yielded a good crop after passing the 180 colonies, spring count. Was the location overstocked? No, but the ranchers found the growing of red-clover seed so profitable that the acreage of alfalfa was reduced very greatly. Even the largest number of colonies in this apiary always bred up nicely, and went into winter quarters heavy in stores, but the nectar for a large yield was not to be had.

Reduced Yield Result of Reducing Size of Ranches.

In a good alfalfa location, overstocking is probably seldom the cause for reduced yields, but rather the change which occurs sooner or later in the breaking up of the large ranches into smaller tracts with such diversified farming that there is no alfalfa in large tracts, the small fields of alfalfa being so quickly cut that the bees cannot gather a large surplus.

At this time I have only one apiary in the old-time locations of 10, 15, or 20 years ago, as the change described above has rendered beekeeping unprofitable except in the newer regions.

In the location where I formerly had the large apiary described, there are reports that the ranchers are no longer securing the large yields of red-clover seed which were secured when there were millions of eager workers ready to help pollinate the blossoms. Perhaps you may retort that the honeybee does not pollinate the red-clover blossoms, but when the alfalfa has all been cut, and the bees are seen all over the red-clover fields, the writer will believe until the contrary is proved, that much of the seed crop is due to the work of our honeybees.

One who has never heard the great roar of the flying bees in yards of 500 colonies or more, would be puzzled, when quite a distance from the yard, at the roar of flight of these hundreds of thousands of pairs of tiny wings.

The writer for several years had a comb-honey yard of 200 to 300 colonies and never observed evidence of overstocking. Yards of 150 to 200 colonies, run for extracting, have given good results.

It has occasionally happened that some one has located an apiary very near one of my yards; yet, if he has been a good beekeeper, both have had good crops, but no one has ever located near any of our largest yards. Recently, an exceptionally good beekeeper located a yard between two of ours, yet one of these yards was, that season, one of the most profitable of our apiaries. I never abandon a location because of crowding by others, but instead I increase the number of colonies in that locality. In poor seasons, even the very small yards do poorly.

Some Disadvantages of Large Apiaries.

The large apiary of 200 colonies and upward has many advantages in economy of operation, yet for other reasons there are now but few such yards in western Idaho and eastern Oregon. First, if robbing occurs, and an undiscovered case of foul brood is robbed, either in the apiary, or belonging to some careless farmer, there is great danger of infecting a large number of colonies. A few years ago, one of our apiaries of 100 colonies was robbing a yard of about 30 colonies near by, nearly all foul, yet only 69 of our colonies were infected.

If our yard had contained three or four hundred colonies, the loss would have been great. In spring and fall, the small apiary is far easier to work without serious trouble from robbing. The comb-honey producer, with his little one-story hives, can better cope with this robbing nuisance; but the extracted-honey producer, with his three, four, five, or even six or seven story hives, must remove honey at times when conditions are so conducive to robbing that he sometimes wishes he had never seen a bee. Then the robbing is a serious handicap, especially in large yards and during or after the honey flow. This robbing can be partially overcome by the use of queen-excluders, bee-escapes, and by working part of a yard, then moving to another.

In the irrigated regions, with the increasing area intensively farmed, it is becoming more and more difficult to find places to put an apiary, as land values are very high, and almost no one will have an apiary near a cultivated field, since, owing to the absence of trees, bees fly low, especially on windy days, and may make trouble for men and teams at work in the fields near by.

Because of new land going into cultivation, odd corners being leveled and cultivated, and changes of ownership, apiaries must often be moved, and the small apiary is easily moved to a new location.

I hope to own the land on which one of our best apiaries will be kept, and will then again experiment toward a large yard, provided there are not several yards near by, for unquestionably there is a limit somewhere.

When Large Apiaries Are Advisable.

In a good location, where there are few bees near by, where there is small change in the crops raised from year to year, where the beeyard is surrounded by trees so that the bees do not fly low enough to be a nuisance to others, where reasonably good crops may be expected from year to year, and where there is a good supply of minor plants to provide spring and fall feed, perhaps few fields of endeavor hold more promise than testing one's locality to determine if 200, 300, or perhaps more colonies, may yield good crops, for there is no question but that honey can be raised far cheaper in a small number of large yards than in a large number of small yards, other factors being approximately equal.

Meridian, Ida.

[In some carefully conducted experiments by the U. S. Department of Agriculture in 1911, it was found that the honeybee is as efficient a cross pollinator of red clover as the bumblebee. See United States Department of Agriculture Bulletin No. 289.—Editor.]

One of E. F. Atwater's apiaries in Idaho. This apiary is located on an unirrigated spot but near irrigated fields. Such apiary sites are difficult to find.

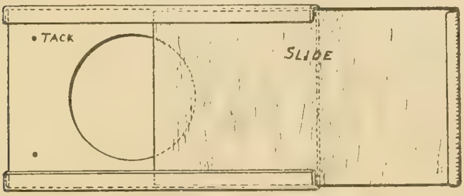
FROM THE FIELD OF EXPERIENCE

A NEGLECTED CONVENIENCE

The Hanson Ventilator Is Not Often Mentioned, tho Inexpensive and Useful

In the Beekeepers' Review for 1911, on page 175, is an article by E. F. Atwater in which the Hanson ventilator is mentioned and a cut shown, but nowhere else in bee literature is it mentioned so far as I know, yet those who use it would not willingly abandon it and have found it convenient in so many ways that they wonder why it has not come into general use.

It is placed about the middle of the front of each super and hive-body and is especially adapted to the needs of extracted-honey producers. It is made of galvanized iron, as shown in the accompanying drawing, the hole being 1¼ or 1½ inches in diameter. The long edges of the part which is fastened to the hive are folded over for 3/16 of an inch to form a groove for the slide which closes the hole or for a bit of screen wire-cloth or of queen-excluding zinc. Do not make the mistake of painting over the ventilator when repainting a hive, as it will interfere with the free action of the slide.



The Hanson ventilator, made of galvanized iron and tacked over a 1¼-inch hole in end of hive-body.

This ventilator is being used considerably thru the West, and the principle of a hole in the super has long been used in the East; but when wanted closed, the closing has usually been done with a bit of section tacked on, which is far from satisfactory. Those Hanson ventilators made for me cost two cents each, being made by the local tinner from scrap stuff during spare time, but they surely could be included with the hive as it comes from the supply dealers without appreciable additional cost. Those who know its advantages feel that supply manufacturers would be conferring a boon on the industry if every Langstroth super should be equipped with a Hanson ventilator.

We all know how well the bees like to use an auger hole for an entrance, and this ventilator provides just that thing, with the result that many of the field bees will use this entrance to one of the supers in preference to the regular entrance, thus removing the fear anyone may have of a queen-excluder being a honey-excluder, as a great part of the nectar carried in does not go into the brood-chamber, but directly into the super where it is wanted and so never has to be carried up thru the excluder at all.

On hot days and evenings when bees hang out at the entrance in great bunches, it is only a few minutes' work to open the slides in the Hanson ventilator, and it makes the beekeeper happy to see the little fellows rush inside and get busy where they ought to be. In ten minutes the front of the hive is often cleared. Then, if less ventilation is wanted, the bees just form a ring around the edges of that auger hole and regulate the ventilation to suit themselves; and if the beekeeper is absent or neglectful, and cold weather comes on in the fall with the slides still open, a little bunch of bees will plug up that hole solidly, even becoming detached from the cluster, staying there even when they are too chilled to move freely.

Another use is in the making of increase and in having queens mated from the upper story. When colonies are strong and the time is right, and you want to take brood from the brood-chamber, put the queen below the excluder on combs or foundation or starters as the case may be, then the storage supers on top of the excluder, with another excluder above the storage supers, and on top of this second excluder place the super of brood with the Hanson ventilator open or partly open and turned to the rear. Then when you see, anywhere in the apiary a Hanson ventilator on the rear of a super, you know at once what is going on there, and if you give a ripe queen-cell, there will be a good colony there to set off on a new stand within a few weeks. If no increase is wanted, simply kill the old queen and put the top brood-chamber with the young queen in it down on the bottom-board under the old brood-chamber and the hive is requeened without any trouble. This is an easy method of swarm control, and the Hanson ventilator adds to the ease of doing it.

The ventilator may be used for the entrance to the brood-chamber in a nucleus, closing the regular entrance, as a round hole is easily defended or the slide may be closed so as to admit only one bee at a time. In making nuclei, it is easy to slip in a piece of wire cloth closing the regular entrance as well as the ventilator; then make the nuclei and place them where wanted, with no danger of suffocation. Then when you wish, just open the ventilator enough to allow a bee to pass, and leave the wire cloth closing the entrance. When you wish to move to another location, just close the slide, and your nucleus is ready to place where you wish it. This can also be done with full colonies, the top and bottom screens being put on all ready for moving, the bottom-board, of course, being turned so the bees cannot run under the hive; the ventilator being open now serves as the entrance. When evening comes all the bees will find their way into the hive, and it is very quick work to go around and close the slides, when the hives are bee-tight instantly, all the work of preparation for moving having been done by daylight. When the side is closed, it stays put, not being pulled off or split off, as often happens with a piece of section.

The accompanying drawing shows a Hanson ventilator about three and one-half inches long by two and one-eighth wide, with the edges turned over 3/16 inch to form the groove for the slide. It is such a simple, inexpensive little device and so useful in many ways, which will be discovered only when the beekeeper begins using it, that I believe its use should be promoted.

Washington, D. C. E. L. Sechrist.

SOME ENGLISH APIARIES

Typical Small Apiaries of England and Some English Beemasters

Beekeeping in England is almost overwhelmingly conducted in small apiaries. More than a ton of honey is rarely taken in one yard, and that is probably an assemblage massed for the heather from several smaller summer establishments. Mr. Bartlett is perhaps the most extensive English beekeeper. He usually harvests from some five hundred hives scattered over a part of Oxfordshire, and he has also a monopoly of beekeeping in Scilly Isles, thanks to an agreement with the sole landowner. He believes that the British bee could make a new start from this point, whence an immune strain could take the place of the disease-rotten medley of ancient and imported stock that some people think populates the mainland. This idea not unnaturally excites the jealousy of other breeders and bee-merchants.

I have not been able to visit any of Mr. Bartlett's apiaries. There would, however, be nothing special in a photograph of one of them, for this English bee-king, like others, finds it essential to avoid the disaster of disease by splitting his bees among moderate-sized yards. In spite of all precautions, he was practically wiped out a few years ago.

Mr. Ford, a retired schoolmaster, has a first-class little garden apiary near the garden town of Cheltenham. His ambition is to stay at 50 uniform strong stocks. Two years ago he reached 49, then had a serious setback from which as yet he has only half recovered. In their long row under the old apple trees, facing a hedge perhaps a trifle too high, his bees were gathering clover honey hand over fist when I visited them. The wholesalers take it greedily at a shilling

A crowded apiary near Gloucester, England.

FROM THE FIELD OF EXPERIENCE

per pound, bottles extra, and Mr. Ford should add nicely this year to the not inconsiderable savings that his bees have brought him for many years. Last winter he rendered down 1,500 combs that would have been of great value to him intact, if there had not been disease among them.

Mr. Ford, a retired school teacher, derives great pleasure from the care of his little apiary near Cheltenham, England.

A small orchard apiary of another kind is that of Mr. Brinkworth at Stroud. He is a successful breeder of queens, has never had Isle of Wight disease, tho it has raged round him for nearly 20 years, and he has been instrumental in restarting hundreds who had lost all but heart thru that malignant plague. In the past he has imported many queens from Italy, Carniola, and the Caucasus, but this year is breeding from his own stock rather than go further, perhaps to fare worse. When Russia gets settled enough, he means to get Caucasians again, for the considers them the best bees he ever handled.

On the other hand, Mr. Swaffield swears by Carniolans. He has three apiaries high among the Cotswolds, in one of which he has an excellent chance of mating pure. Here these pretty bees and their drones are flying by millions and thousands. It is a treat to open the hives, for they are very quiet, standing still on their combs almost like guardsmen on parade. The prettiest bee of all and one of which Mr. Swaffield speaks very highly is a Carniolan-Italian hybrid, touched all over with pale gold in a very pleasing manner. The stock, a very strong one, was being goaded by all means into swarming, to see how long it would resist, which it had done to an extent almost to warrant the description non-swarmer. It has since given a strong shook swarm and 200 pounds of honey.

Mr. Swaffield's country is one of the finest honey-lands in Great Britain. You can see for miles across the swelling uplands, cut into fields all ploughed, and every third patch gay with sainfoin, crimson clover, turnip kept for seed, or the charlock, the weed welcome to beekeepers and almost invincible to the farmer. Up here, Mr. Wood discovered the virtues of wild white clover which he sells after a severe drop at some twelve shillings per pound. He grows about a hundred acres for seed and has a standing agreement with Mr. Swaffield for their mutual advantage in seed and honey. I rather pleased them both by reading a paper at Gloucester last year which showed that for every pound of honey that the bees collected from white clover they helped the

J. E. Swaffield's white clover apiary located in one of the finest honey regions in Great Britain.

FROM THE FIELD OF EXPERIENCE

plant to set 34 pounds of clover seed, or about 300 times as much cash for the farmer as for the apiarist.

We have all heard of Adminsons and of the Apis Bee Club at Benson in Oxfordshire. I give a little view of a part of the Adminson apiary. Dr. Abushady is out of the scene. He was talking with W. Herrod-Hempsall, who was on an inspection tour of restocking apiaries for the Government. At Benson you can examine the merits and other qualities of every race of bees, study all the up-to-date apparatus of beekeeping, and luxuriate in a very fine library. Material equipment, such as buildings, etc., has yet to be supplied as beekeepers wake up to the importance of supporting this central institution with money. Dr. Abushady is a driving force that has overcome many obstacles, and I was glad to find him with plenty of vigor for further advance along what I hope will prove an easier road than the one already traversed. The Adminson metal comb (semicomb) may be said to have won its way now. It is a marvel of construction, which the bees seem to appreciate no less than their masters. The brood-rearing chamber is another very notable gift from Benson to the craft of beekeeping.

G. S. Armsond.

Sheepscombe Strand, Gloucestershire, Eng.

Part of the Adminson apiary at Benson, Oxfordshire, home of the Apis Club and The Bee World.

* * *

SMILES AND SALESMANSHIP

How a Witty Scotchman Captivates Prospective Honey Customers in Milwaukee

Bishop Quayle says that he gets great fun in watching the actions of folks. It is an inexpensive form of entertainment, but I have found it worth while. I have discovered that some men are dead, but they lack sense to lie down. I have been closely watching the antics of some so-called honey salesmen, to my great profit, and, in addition to the cash, I have found out that they try to sell God's great gift as an undertaker would sell a casket.

It may be that I am fortunate, in that I was born and raised in dear old Scotland, and fervently thankful that I am an American. I still hold to my native speech, to the great delight of some of my friends. And it may be that my speech and manner as well as good looks help, but I am convinced that in spite of these handicaps, I could walk around some beekeepers who essay to sell their product. And some of my good friends will ask, how would you? I'll tell you.

I was born and raised in a town called Renfrew, famous for its royal origin, and for its godly beekeepers. Mr. McLelland, the parish minister, and James Blair, a grocer, both fine beemen, were my early instructors. McLelland has passed on; Blair still sells sugar and preaches the gospel. He was my Sunday school teacher and counselor; would that I had listened to him more. He was the most convincing talker I have ever known, for whether his theme was Jesus Christ or bees, the earnest, intelligent knowledge of his subject impressed you.

I have tried to follow his way, with the result that I find no difficulty in selling my crop, and at three cents per pound more than the local selling price. I do not wierdly inform my prospective customers that I have honey to sell. I first captivatingly smile, speak of the joyous day, ask them if they like honey, talk briefly on the bees, and how the honey is produced, and if they do not begin to ask questions (they usually do) I let them sample and ask them to buy.

I may not sell, but I give them my card, and hope that I have booked a customer for another beekeeper, if not myself. If they tell me that they buy regularly from another fellow, I inquire his name, and congratulate them on their good fortune in dealing with a good man (for Milwaukee County beekeepers are good men) and advise them to continue. They may never buy from me, but that pasteboard is not wasted. Last Saturday afternoon I took a load of honey to a public market, talked until my tongue was tired (that means something for me), came home with $33.00 in my daughter's pocketbook (you can't trust a Scot with money), and my lone competitor had sold two quarts. And think of the fun I had in addition, and the infectious joy of it! And as I "stepped on her," the rustling autumn leaves floating in the sky seemed as banners that God himself has put out.

My good, dear friends, get some joy out of your selling. Grace Allen (bless her) is doing her best to add romance to your beekeeping. E. R. Root is doing his share in trying to make your business a success, but they are as voices crying in the wilderness until you learn to talk entertainingly and convincingly of your product.

West Allis, Wis. Joseph S. Barr.

ANOTHER HARBISON BEE BOOK

Published in 1860. Written by W. C. Harbison, Brother of John S. Harbison

Beekeepers are generally familiar with "The Beekeeper's Directory or the Theory and Practice of Bee Culture in all its Departments," written in 1861 by John S. Harbison, who introduced commercial beekeeping into California and laid the solid foundation for the industry in that State. It may be a surprise to many, as it was to me, to know that his brother, W. C. Harbison, also wrote a book on beekeeping, issued in 1860. Since a copy of this interesting book came to me this summer, it may be of interest to share a few facts about it with others.

W. C. and John S. Harbison were the sons of William and Margaret Curry Harbison and grandsons of John and Massy White Harbison, and were born in western Pennsylvania. Margaret Harbison was the daughter of William Curry (or Currie, according to the war records of the Revolutionary War), and while the author's initials only are given in the W. C. Harbison book, one will probably not be far wrong in guessing that his full name was William Curry Harbison and that both brothers were named for grandfathers. The father, William Harbison, was a beekeeper, and in both of the Harbison books reference is made to the fact that the authors learned beekeeping in their youth. John S. was engaged with his brothers (three sons and one daughter in the family) in the nursery business in western Pennsylvania, and they also kept bees. In 1854 he could not withstand the temptation to go to California for gold, and he sailed down the Atlantic Coast, crossed by the Nicaragua route and went to Sacramento. He soon found gold hunting unattractive and started in the nursery business, but, as is well known, he soon took up beekeeping, after going east for some colonies of bees.

The first shipment in the spring of 1857 was made by John alone, but in the fall of 1858 he made another trip east for bees, and this time his brother W. C. returned to California with him. In both of the Harbison books directions for shipping bees to California are given. Evidently California did not have the attraction for W. C. that it had for his brother John, for he returned to Chenango, Lawrence County, Pa., in time to write his bee book and publish it in 1860.

The two books are not at all alike in make-up, so that they were obviously written independently, and, in fact, I have failed so far to find in either one any reference to the other book. W. C. wrote his book in time to have it published in 1860, while John did not get his out until 1861. Both books show evidences of a thoro study of the beekeeping literature available at the time, and one must conclude that the Harbison brothers were thoro students in their chosen field. The shallow Langstroth hive did not appeal to either of them, and while they give great credit to Langstroth for his invention and work on beekeeping, they both preferred a deeper hive. The Harbison or California hive was invented and patented in 1859 by John S. Harbison, and in both books this hive is described and recommended.

A biographical sketch of John S. may be found in vol. II of "A History of California," written by James M. Quinn, and from this sketch it is clear that the Harbison family was a notable one. The records of the family run back to the year 1435 in Ireland, and several ancestors of the Harbison brothers had experience in the early Indian wars and in the Revolutionary War. Their grandfather, William Curry, was chief armorer in the field under General Washington, was in eight battles, was present when Washington crossed the Delaware, and was in charge of the armory at Carlisle in which many noted British prisoners were imprisone.

Little information is available regarding W. C. Harbison, except the information as to his keenness of observation which he has shown in his book. He preferred the quietness of Pennsylvania to the pioneer life of California, and probably he did not make as much money from his bees as did his more daring brother. He did not have the opportunity in the East to establish so great a reputation as did John, by founding beekeeping in the State which has for years lead in honey-production in the United States.

The W. C. Harbison book is entitled "Bees and Beekeeping: A plain practical work; resulting from years of experience and close observation in extensive apiaries, both in Pennsylvania and California, with directions how to make beekeeping a desirable and lucrative business." The book was published by C. M. Saxton, Barker & Company of New York City. It contains 287 pages and, like his brother's book, tells how to obtain a right for the use of the Harbison hive. E. F. Phillips.

Washington, D. C.

THE MARKETING PROBLEM

Lack of Uniformity in Prices. Folly of Peddling Honey at Wholesale Prices

I am just wondering if all who report the local markets for honey on page 609 really understand the questions. Referring to the last column, which seems to mean the retail price of a five-pound package of extracted honey, I note that there is a variation from 60c in two or three States to $1.75 in southern Idaho. I doubt if anyone anywhere is getting $1.75 for five pounds of extracted honey, and especially in southern Idaho where they are offering extracted honey at 9c to 10c a pound in single five-gallon cans. If anyone is charging $1.75 retail for five pounds it would seem to be a little like profiteering. I notice several quote five pounds of extracted honey at $1.50, which is not quite so bad, but surely not much honey will be used at that price these days, at least that is my thought.

Here in Spokane just now honey (extracted) is retailed at all kinds of prices—from 15c a pound where they bring their own containers to hold the honey, to 45c for 1¼ pounds net, or 34c a pound. Yes, and one store was asking 50c for one pound two ounces.

I know there are altogether too many middlemen, but there are not too many retailing honey who really "know honey." If I had thought otherwise I certainly would not have gone back into the game again. But I felt that possibly I might be of real service to honey-producers in the Pacific Northwest country, provided I can have their co-operation. Of course, if they are not willing to co-operate, either among themselves or with dealers who desire to help, then the producers deserve to lose out. My sympathies for years have been entirely with the producers, but when they expect conscientious dealers or retailers to help them dispose of their products, and "do it for nothing and board themselves," then I say such producers should be ignored, and left to flounder along as best they can.

But we have some queer beekeepers here in the Pacific Northwest, too. For instance, they will sell retail at the same price they expect dealers to pay them. There was a Yakima beekeeper here in Spokane for a few days recently, selling and delivering honey to consumers at $1.40 for a 10-pound pail. That beekeeper expected me, a dealer, to pay him $1.40 f. o. b. Yakima for the same honey. Of course I would have to pay the freight to get it to Spokane. There was really no good excuse for retailing the fine Yakima honey anywhere at 14c a pound with cost of pail thrown in. Every pound of it should go at not less than 20c or 25c a pound to the consumer, and would bring that price in small quantities if beekeepers or producers were properly organized. But they must be willing that a dealer who advertises, rents a store, and puts in his time, should receive fair returns for his investment and efforts. Until honey producers are willing to grant this to dealers, they deserve to lose on their honey. "Live and let live" is a pretty good policy to pursue.

By the way, is honey "the oldest food?" I supposed that meat as food is older. I notice an advertisement in the September "Good Housekeeping" that says honey is the "oldest food." If I am wrong I will be glad to be shown. If I am right, then I doubt if it will pay to spend good money to advertise or tell the world what isn't so.

Spokane, Wash. George W. York.

POLLEN IN BEES' DIET

Why Pollen is Necessary. Composition of Larval Food and Royal Jelly

If you have ever eaten a piece of comb honey containing pollen, you know that the latter is pretty apt to spoil the pleasure of the treat. For the bee, however, pollen is a life-element, just as important as nectar, and it may well be called bee-bread. Altho honey is an ideal food in many respects, it is almost entirely lacking in albuminous matter—the muscle-forming substance. But pollen is very rich in nitrogenous matter, containing also some other elements not found in nectar, altho the amount of all these substances varies with the different kinds of pollen. A single blossom usually contains thousands of these tiny pollen grains, which, under the microscope, show a particular shape for every variety of plant. This fact sometimes furnishes useful information in the analysis of honey. The color of pollen also varies much, but yellow seems to be the most common. Once I saw even black pollen—black as ink—which contrasted singularly with the snowy white of the new comb in which it was found.

Some pollen is quite dry; but generally it is more or less moist, and in some cases even quite sticky. In a park in Buenos Aires I once had a chance to observe a typical case of sticky pollen. A tree of the hot northern forest regions, of the variety *Chorisia insignis*, was just in bloom, and visited by a few bees. The blossoms were very numerous, white, and large, resembling the garden lily. On account of the unusual stickiness, a bee after visiting such a blossom remained suspended in the air at the same spot, about two inches from the flower, constantly rubbing its legs as it gathered its baskets full of yellow pollen. The bee remained in this attitude about half a minute, which at first raised the question whether it was not a syrphus fly; but being only about three feet from my eyes, I could convince myself that it was really a bee.

In some parts of Europe the hazel, a wind-fertilized plant, furnishes the bees with the earliest pollen in spring. This pollen is very dry, containing only about 5 per cent of water. The albuminous substances amount to only 30 per cent, while about 60 per cent is composed of carbo-hydrates (among which are starch, 5 per cent, and cane sugar, 15 per cent). There are also resinous substances, fat, pigments, ash, and other indigestible matter, such as the shell of the pollen-grain.

The pollen of the common pine is much less valuable, with only 16 per cent of albumen, while the indigestible shell represents 21 per cent. As is seen from this, the pollen-grain is provided with a shell, and it is only after being crushed by the mandibles and by the action of the chylus-stomach that the nitrogenous constituent is released.

Many beekeepers have a mistaken idea that the white jelly with which the larvae are fed is only a mixture of pollen, honey, and water. In reality this jelly, or at least the greater part of it, is a direct product of secretion by certain organs of the nurse bees, and can, therefore, be compared to the milk of mammals. The laying queen also requires for her function a comparatively great quantity of albuminous food (not found in honey), so there is no doubt that at least a part of the food given her by the bees is prepared jelly—bee-milk.

Very interesting investigations along this line were made by the late Dr. A. von Planta, a scientist accustomed in his researches to close observation and painstaking care. In fact, he was not only guided by the scientific interest, but just as much also by his love for the little busy worker; for during 20 years, till his death, he had been vice-president of the Swiss Beekeepers' Association. He found that some pollen is only added to the jelly (chyle) given to drone-larvae from the fourth day; while from the fourth day, for the worker-larvae, the jelly is weakened by the addition of a little more honey, but no pollen. The royal jelly, on the contrary, is of the same composition for the whole period—pure predigested jelly (chyle).

The dry substance of royal jelly consists of 45 per cent albumen, 14 per cent fat, and 20 per cent sugar.

A normal queen-cell usually requires about 14 times more dry substance than a drone-cell, and about 90 times more than is given the worker-larva.

The amount of liquid jelly required for the different cells has been found to be: queen-cell, 0.2 gram; drone-cell, 0.01 gram; worker-cell, 0.002 gram.

On the average the royal jelly contains 69 per cent water and 31 per cent dry substance. Drone and worker jelly contains 72 per cent of water and 28 per cent of dry substance. Ernest Tschudin.

Buenos Aires, Argentine.

COLLEGES AID BEEKEEPERS

State Agricultural Colleges Ready to Help Beekeepers by Giving Practical Instruction

Many beekeepers, it seems, either do not know of or do not appreciate the service available thru the state agricultural colleges.

It was only recently that I learned from our gardener (with whom I was talking over a bee problem that was puzzling me) of the New York State School of Agriculture, located about 15 miles from here on Long Island, at Farmingdale. I called the school on the telephone to inquire if they had a department of apiculture. They replied in the affirmative and said they would gladly give me information regarding bees any week day between the hours of eight a. m. and four p. m.

Whether or not other state agricultural schools offer the same service I cannot say; but if they do, it should be known to everyone interested in bees, and especially to beginners, to whom a little practical instruction from one thoroly versed in apiculture would give confidence in handling their bees. Magdalen Sproull.

Freeport, L. I., N. Y.

SIFTINGS

J. E. Crane

A GOOD deal has been said or written as to whether bees can or can not hear. No organs of hearing have been found as yet on the bee, I believe. The fact that bees make different sounds under different circumstances or conditions has led me to believe that bees could either hear or in some way recognize these sounds. That they are able in some way to communicate their feelings, impulses, or desires to each other and to a whole colony seems beyond dispute, but how?

* * *

Robt. W. Hall, on page 694, gives us an interesting paper on ''A Bumblebee Guest.'' After giving his experience of a colony entertaining and retaining such a guest he inquires, ''Do we know of any case of bees driving out or in any way injuring any adult insect except a robber, a strange queen, or drones in their cells?'' We have sometimes found in a hive dead bumblebees that the bees had evidently killed but were unable to drag out of the entrance. They may have been considered as robbers, as undoubtedly they were.

* * *

On page 710 Geo. S. Demuth, in giving directions for the temperature of honey for bottling, says the honey should not be heated to a temperature above 160°F., nor held there long, for the flavor of some types of honey will be injured even at 160°F. if kept hot too long. I was pleased to note that he says ''some types of honey are more easily injured by heat.'' There appears to be a great difference in the amount of heat that different kinds of honey will bear without injury to the flavor.

* * *

One of the good things of the November Gleanings is the article by Geo. S. Demuth on the ''Quiescence of Winter,'' page 681. The health of the winter life of bees is told so simply and clearly that it would seem as tho the merest tyro must understand. He says, ''To live long, bees must live slowly;'' and again, ''In a sense wintering may be thought of as putting bees away in cold storage to keep them fresh until spring.'' When I read such a clear explanation of the principle of successful wintering I cannot help thinking of the advantages of the modern beginner in beekeeping over those of us who were trying to master the subject 50 or 60 years ago.

* * *

The historical review of the various methods of making ''Queen Cage Candy,'' by Dr. Phillips and Jay M. Smith, brings very forcibly to our minds the value of that division of the U. S. Department of Agriculture devoted to the interests of beekeepers. Few beekeepers have the time or means to investigate many of the intricate problems connected with our industry. The recipe for making the best possible queen cage candy is given at the close of the article, pages 690 and 691. We may consider this question as settled and settled right.

* * *

A few evenings ago my daughter brought home from the town library a book entitled, ''How Animals Talk,'' by William J. Long, and published by Harper & Bros., New York and London. The author has had a large experience with wild life in different countries and is a charming writer. He takes the ground that bees, birds, and beasts are often able to express their feelings, desires, or emotions to others without audible speech. He calls this power or ability ''natural telepathy,'' or ''thought transference.'' He illustrates and enforces his argument by an almost innumerable number of examples in wild and domestic animal life. The book is well worth a careful perusal by any or every one who would investigate this subject with more care, or is fond of hunting wild life.

* * *

In the two pages (697, 698) of advice that Mrs. Boyden gives to housewives, there is one paragraph men may well read with profit. She says: ''He may be actually starving while eating to excess every day. Fed on a balanced ration that same person will eat much less, feel satisfied, and enjoy better health.'' To gain a correct knowledge of the value of the various kinds of food one meets with in these days of luxury, and the ability and self-control to choose wisely are of more value than gold or silver.

* * *

The value of windbreaks has not been fully appreciated until recent years. E. R. Root's illustrations of this subject on pages 684, 685, and 686 are not overdrawn nor their value overestimated. We learned our lesson along this line a good many years ago when we found the bees on one side of a yard exposed to the winter winds entirely dead altho in winter-packed hives.

* * *

That is a most valuable report given on page 716 by Prof. H. D. Hughes on Hubam Clover. If this clover seed can be sown with spring grain or on fields of winter wheat and produce a good crop of clover to be plowed under later in the season and thus restore the fertility of the soil, it would seem as tho it would prove almost invaluable.

OUR FOOD PAGE

CONSTANCE ROOT BOYDEN

(Stancy Puerden)

Most of us can look back on certain delightful little interludes in our lives, which came to us by accident. Such a good time recently came to the busiest man I know and his wife.

In order to have certain work done on our home we had to leave it for a couple of days, and so we went down to our summer cottage on a little lake a few miles from town, altho it was in November with stormy weather predicted. At the last minute our fourteen-year-old daughter decided she was so busy she would stay in town with cousins, and after one night at the cottage our older son decided he had an urgent reason (feminine, I suspect) for going away for a day or two. That left the family reduced to its lowest terms, for our younger son is in college and I let my young assistant go back to town.

My, but it was cold that Saturday afternoon, for our little cottage is on a high bank above the lake and a perfect gale blew thru the great oaks above it, whistled under it and around it. The fireplace was balky and smoked a trifle, the range in the kitchen did little to raise the living-room temperature, the bedrooms had an icy chill, the lake was a cold gray, flecked with little whitecaps, and the wind was trying to strip the last dry leaves from the oaks.

The busy man spent the day in the office back in town, of course, but late in the afternoon he drove back to the cottage. You know some men can always make a fireplace behave. Well, he is one of them. In five minutes the fireplace had braced up and so had his wife. And then the busy man took a big saw and an axe and went out into the grove to replenish our woodpile from certain fallen trees. In a short time a log nearly three feet long and a foot in diameter was blazing in the fireplace with smaller sticks around it, and we were enjoying a hot supper on a little round table close to the fire. The fire crackled and blazed and glowed red, the wind roared outside, and we decided a summer cottage is not a bad place in the winter even if the ducks were the only ones who were tempted to go in bathing.

After supper we sat in easy chairs and enjoyed the fire for a time, and then the busy man had to go out and cut more wood for the night while I washed dishes and put the kitchen and living room in order.

We went to bed ridiculously early because nothing and no one prevented it and we were sleepy, and the two logs which had been left on the fire made a flickering light which could be seen thru the transom over the bedroom door.

Very early in the morning the busy man rose to investigate the condition of his fire and make sure the water pipes had not frozen. He found a great bed of coals in the fireplace, and his fuel being gone he dressed and went out and I could just hear him in the distance cracking the Sabbath as well as the log. He came in and reported that it was a wonderful morning, clear and bracing and starlighted. In a short time there was another brisk fire in the fireplace, and I smelled something which warned me I must dress if I did not care to miss a good breakfast. It happens the busy man can cook some things quite as well as his wife can, and enjoys displaying his skill—occasionally. However, he never contributes any recipes to this page. We had fruit, crisp bacon, griddle cakes with honey, and coffee, and we kept the hot things in that condition by putting them on the stone hearth close to the fire.

The busy man says he likes to go to the cottage because he can forget business for a few hours, but I don't believe he ever before did such successful forgetting as during those cold November hours when our only neighbors were the gray squirrels in the oak trees.

Altho most of us like to play at pioneering or roughing it we would not be willing to give up permanently many of the conveniences or refinements of civilization such as telephones, automobiles, electrically equipped homes, steam heat, running water, and (shall I say it?) package foods. You see when the senior editor of Gleanings advises people to buy foods in bulk rather than in packages, because the latter are more expensive, it behooves the food editor to be a little careful what she says.

Granting that package foods may have raised the cost of living a little and that many foods are sold in packages which might as well be sold in bulk, there is much to be said in favor of package foods, and I am going to say some of it right here and now.

In the first place, the package is the manufacturer's or producer's guarantee of cleanliness and purity. His reputation depends upon his keeping up the standard of the food in the package on which is his name.

Sanitary packages which are insect and moisture proof tend to prevent waste and may be kept almost indefinitely before opening, while many bulk foods will deteriorate if not spoil under similar conditions.

The package is one of the reasons why we are able to enjoy such a variety of foods produced in all parts of the country from

Maine to California and even in foreign countries.

The convenient package saves both the grocer's and housekeeper's time and is the only form in which foods can be handled in such serve-self cash stores as the Piggly Wiggly stores so popular all over the South.

As for honey, it is the clean, sanitary package which enables 50,000 grocery stores thruout the country to keep it in stock, in good condition the year around. Retailing it to automobile customers along the principal highways is a fine thing, so far as it goes, but just ask any intelligent beekeeper if he would like to see the grocery stores discontinue handling honey. It is to the beekeeper's interest that honey should be regarded as a staple food the year around, and the package is the only way in which it can be done.

As to honey in small glass jars, any honey salesman will tell you how difficult it is to persuade people in the cities to buy large packages. A honey salesman once said to me, "Mrs. Boyden, how can you expect people who buy bread by the slice to buy honey in large packages?" He told me there actually are people in the congested parts of some of the large eastern cities who buy a few slices of bread at a time.

Also, the small honey jar is attractive enough to put on the table, and we all know how difficult it is to avoid waste in transferring honey from a large can to a serving dish. And don't forget that several jars of honey in a little basket with a spray of holly makes a most attractive Christmas gift for some honey-loving friend.

CHRISTMAS GOODIES.

CARAMELS.

1 cup granulated sugar
1 cup brown sugar
¼ section of honey (comb and all)
1 cup cream or evaporated milk
½ cup sweet milk
1 tablespoon butter
1 teaspoon vanilla
1 cup chopped nuts
Few grains salt

Combine all the ingredients but the nuts and vanilla and cook over an asbestos mat, stirring occasionally, until the thermometer registers 250 degrees F. or until a little dropped in ice water is of the right consistency for a caramel. It must be carefully watched the last few minutes of boiling to prevent scorching. When done add the chopped nuts and vanilla and pour without stirring on to a buttered platter or shallow pan. When partially cool mark in squares, and cut and wrap in oiled paper when cold. Slightly sour cream may be used instead of sweet.

One square of chocolate added to the above will make delicious chocolate caramels.

FIG FUDGE.

¼ cup chopped figs
2 tablespoons honey
2 cups granulated sugar
¼ teaspoon ginger
½ cup cold water
1 tablespoon butter
½ cup chopped hickory or pecan nuts

Combine all the ingredients except the nuts, stir until the sugar is dissolved, and cook until it makes a very soft ball when tested in ice water. When tested by thermometer it should not register more than 234 degrees F. Partially cool, add the nuts and stir until it begins to thicken. Pour out on a buttered platter and cut in squares when cold.

GOLD NUGGETS.

1 lb. peeled and sliced pumpkin
¾ lb. granulated sugar
2 tablespoons honey
½ lemon sliced
1 oz. ginger root (dried)

Cover the pumpkin with the sugar and let stand over night. Drain from the syrup which will form and boil the syrup down until it is thick enough to coat a spoon. Add the pumpkin, the honey, lemon, and ginger and simmer until the pumpkin is clear and most of the syrup has been absorbed. Do not cook too long, as the product will darken and a caramel flavor develop. Drain and dry the pumpkin on a plate several hours and then roll in granulated sugar. Cinnamon bark may be substituted for the ginger root.

HONEY NUT SUNDAE.

1 quart vanilla or chocolate ice cream
1 cup honey
1 cup chopped nuts

Put an ice cream dipper of ice cream in a dessert glass, pour honey over it, and sprinkle with the nuts, coarsely chopped.

ORANGE CREAM (*To serve twelve*)

2 tablespoons granulated gelatine (½ box)
1 cup cold water
2 cups boiling water
1 cup granulated sugar
Juice of 6 oranges
Juice of 1 lemon
1 cup heavy cream

ORANGE CREAM (*To serve six*)

1 tablespoon granulated gelatine
½ cup cold water
1 cup boiling water
½ cup granulated sugar
Juice of 3 oranges
Juice of ½ lemon
½ cup heavy cream

Soak the gelatine ten minutes in the cold water and then add the boiling water, stirring well. When the gelatine is thoroly dissolved add the sugar and when partially cooled the fruit juices, which have been strained to remove any fibrous parts. Put in a cold place and when jellied fold in the cream which has been whipped. Mix it in such a way that bits of the clear, golden jelly show thru the cream. If the jelly seems sour before mixing in the cream, add a little pulverized sugar to the cream before folding it in. Chill thoroly and serve instead of ice cream. This is also delicious if partially frozen by putting outside when the weather is below freezing.

HERMITS.

½ cup brown sugar
½ cup shortening
½ cup honey
2 well-beaten eggs
3 or more cups flour
½ teaspoon soda
¾ cup chopped raisins
¼ cup chopped citron
¼ teaspoon salt
¼ teaspoon nutmeg
¼ teaspoon ground cloves
½ teaspoon cinnamon

Cream the shortening, working in the sugar gradually and then the honey. Add the eggs, the fruit, and then the flour in which the other dry ingredients have been mixed and sifted. Let the dough stand in a cold place for an hour or more and then roll out and cut with a cooky cutter and bake on a well-greased cooky sheet in a moderate oven. More flour may be added, if necessary to roll, but chilling the dough enables one to roll it with less flour. If preferred the dough may be dropped from the tip of a teaspoon and patted into shape on the baking sheet. One-half cup chopped nuts may be substituted for the citron.

APPLE SAUCE CAKE.

⅓ cup shortening
1 cup sugar
1 cup sour apple sauce
2 cups sifted flour
1 teaspoon soda
¾ cup raisins, cut small
½ cup chopped nuts
1 teaspoon cinnamon
¼ teaspoon ground cloves
¼ teaspoon salt
1 teaspoon baking powder

Cream the shortening and work in the sugar gradually, beat in about ¼ of the apple sauce and then ¼ of the flour, which has been sifted with the other dry ingredients, and beat smooth, continuing to add them alternately until all are in, and then add the fruit, and nuts which have been lightly floured. The batter should be a trifle stiffer than an ordinary cake batter, and if the apple sauce is very juicy a little more flour should be added. Bake in a shallow loaf pan in a moderate oven.

(*All measurements level.*)

Beekeeping as a Side Line

Grace Allen

A FEW miles north of Tennessee, in Todd County, Kentucky, where for miles one sees great fields of the peculiar green of the tobacco plant, and also acre after acre of wheat, there lives a prosperous farmer who has for years successfully raised both of these crops. He is Porter C. Ward of Allensville, Ky. His brother, Dr. J. S. Ward, lives in Nashville.

One summer 13 or 14 years ago, Mrs. Porter Ward went to Nashville for a visit. When she returned home she reported that the doctor-brother had bought some bees (he later became Tennessee State Apiarist). Porter Ward was disgusted. "That's a fine way to fool away a man's time," he remarked. "And the crazy fellow's going to get stung to death, too," he prophesied amiably.

For several months nothing more was heard about the new interest. Then in the fall the Doctor came up to a little near-by town to see about getting some bees he had bought, and he spent a night on the way with his brother. Porter Ward was sick in bed, but the Doctor, all enthusiasm, started talking about his new sideline. The sick man lay in bed, grunting his disgust. The Doctor sat by his side, talking bees. Presently Porter Ward became interested—more interested—and finally got up out of bed. The next morning he went with his brother to the little near-by town. *And he bought those bees himself!* Recovered from his sickness, he had contracted the "bee fever" —incurably!

He had never been near bees before and knew nothing about them except what the doctor-brother had poured forth that evening. Promptly he got books and journals. Then he moved his newly acquired bees home—and bought two more colonies.

After that start he increased steadily till he had 75 colonies. Then along came European foul brood. He was ruined as a beekeeper, of that he was sure. But he cared too much about those bees to give them up. So he went to work. Unfortunately he made a bad mistake, and treated them all as for American foul brood—shaking the bees, burning out hive-bodies and destroying combs—the pitiful waste of it. And the bees just built new comb and went on calmly having foul brood. At last he read what Mr. Alexander had done and he did likewise—killed his queens, left the bees queenless a short time and introduced young Italian queens. The disease disappeared. Nor has there been a sign of it for several years now.

Tho this foul brood experience had somewhat dampened his ardor, yet after getting cleaned up and all in good shape, he began increasing again, as fast as the farm work would permit. And he now has about 200 colonies, in eight yards—some yards being small because just started. They'll grow. Already indeed, the bee business has outgrown the time he can give it. So now he is planning to give up his regular farming, as soon as he can shape the change, and make beekeeping his main work. He has found the beekeeping more profitable as well as more pleasant. How little they could foresee such a result that summer day when his wife told him about the Doctor's bees and he called him a crazy fellow fooling away his time!

Tho he has usually had two fair surplus-producing flows, he does not consider his location good enough for a specialist. The flows are not dependable enough. There is no fruit bloom near. A little crimson clover and some white clover generally give a surplus. The fall flow is chiefly boneset, some smartweed, and aster. Formerly, he says, the aster never failed, but the last few years it has not been a sure yielder. As for sweet clover, it is growing in favor with the farmers around, yet as a honey producer it has not so far come up to expectations. The bees work it but seem to get very little nectar. But it needs lots of lime, and he himself has already limed practically all his 260 acres, for quite aside from its value for nectar, he prefers it above all other clovers in his farm rotation, and is increasing his own acreage constantly. Perhaps the more lime and greater acreage will make the honey-producing results show up better.

Porter C. Ward, Allensville, Ky., showing his large hive.

Like many others, Mr. Ward started with 8-frame hives because that was what he first bought. Later he changed completely into 10-frame hives. Even these didn't quite satisfy him. So when he heard Mr. Dadant on big hives, at the Tennessee Convention two or three years ago, he was greatly impressed. The reasoning, the conclusions, and the experience—the experience especially—struck this busy progressive farmer-beekeeper forcibly. "I went home from that convention," he says, "a big-hive man. And I dug up and read every thing I could find on the subject."

The next summer he got a few square Jumbo hives from The A. I. Root Company, and he liked them better than anything yet tried. A trip to Hamilton, Ill., that fall, with a visit to the Dadant apiaries, completed his conversion. Since then he has kept on changing till now 70 colonies are in the big hives. "I hope to have all the balance transferred by another fall," he says. "There is no question in my mind but that these big hives very much reduce labor. Lots of room, 1½-inch spacing, good worker combs, young queens, and good super room will reduce swarming and labor—no sort of doubt about that."

Being a farmer, with other work crowding him just when the bees do, the reduction of labor is of vital importance. He has his honey-house at the home yard and does all his extracting there, with an 8-frame power-driven extractor. It is interesting that he uses only a one-size container, the 5-pound bucket.

University Professor as Beekeeper.

The head of the Department of Philosophy of Vanderbilt University, Nashville, Tenn., is Dr. Herbert C. Sanborn. When Dr. Sanborn, then in Winchester, Mass., was a mere boy of fifteen, surely knowing little of philosophy and with only vague faraway dreams of future professorships, he somehow acquired a box hive of bees. Two years later he got a copy of A B C and X Y Z of Bee Culture, an experience which is always, to beginners, like the opening of their eyes to puppies! Promptly he procured a proper kind of hive, transferred his bees, sent to The A. I. Root Company for a new queen and became what a boy would call "a beekeeper right." Thruout his high school years he kept 8 or 9 colonies. And then he left his bees with his father while he went away to college—taking his Ph.B. at Boston University and his A.M. at Tufts College—and then, following the trail of the scholarly youth of that day, went over to Germany: to Heidelberg (how the very name conjures, almost equally, the famous castle, the centuries-old University, solemn learning, drinking songs, and duels!); to Berlin, the center of learning for thousands of students every year; to Munich with its old University and its million-volume library and its once-loved art galleries—ah, the once of Germany and the now, in the hearts of aspiring men! It was at Munich that he took his Doctor's degree, *magna cum laude*.

In all his little trips thruout those years, he was constantly looking up German beekeepers, and when he went over into Italy he hunted out Italian beekeepers. So the flame was kept alive. And at last he came back home and went to teaching, first modern languages and later philosophy. It was in Chestertown, Md., that some beekeeper told him about a swarm of bees that had settled near his home. Dr. Sanborn captured it; and again he was with bees, the sideline delight of his boyhood. Soon he had a dozen colonies, and in the fall of 1911, when he accepted a professorship at Vanderbilt, he put them in a freight car and shipped them to Nashville.

Dr. Herbert Sanborn, head of the Department of Philosophy, Vanderbilt University, gets his recreation by working among his bees.

The next year, 1912, he imported some queens from Anthony Biagny of Bellinzona, Italy—copper-colored queens from the Italion lakes. And the next year, 1913, one of these queens produced 350 pounds of comb honey. To be sure, 1913 was the big year. Yet at that, 350 pounds was a record-breaker for middle Tennessee. And the next year, 1914, when the season registered a complete failure, a daughter of this queen produced 100 pounds. All his recent efforts to reach Anthony Biagny have proved unavailing.

"It is far more interesting than golf," he declares, "and after spending the afternoon here with my bees—and my dogs and vegetables and roses—I go back to school in the morning refreshed in mind and body, ready and eager for work."

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In Southern California. There has been only a light shower since the rain of a month ago, and the grass, that had grown three or four inches high, is now drying up for want of moisture. Just what effect this will have on the honey plants, if we do not get more rain soon, is hard to conjecture. Of course, the ground does not dry out nearly so rapidly as during the spring and summer when the days are long and hot, yet a good soaking rain now would be a great assurance toward a honey crop for 1922.

Beekeepers' meetings will be in order during the coming months. Perhaps the one of most importance to southern California will be a short course in beekeeping to be given by the College of Agriculture of the University of California. The meetings will be held in Exposition Park, Los Angeles, Dec. 5-10, under the auspices of the Farm Bureau. Dr. E. F. Phillips, Geo. S. Demuth, and Geo. A. Coleman are among those who will take part on the program. It is to be hoped that a large number of beekeepers will be in attendance, for much useful information is always to be had at these meetings. When the State and National authorities are not only willing but anxious to help the beekeepers, surely it is not asking too much when we urge the beekeepers to attend these lectures and demonstrations. Many apiarists are always too busy to go to meetings and very often they are the very ones who do not make the greatest success of the business for the reason that they do not keep up with the times. This is to be an advanced course of instruction for commercial beekeepers, and almost every topic of interest to this class of apiarists will be touched upon.

We are finding that we must produce our honey at a lower cost in order to meet the declining prices of our products. By exchanging ideas we are enabled to get information that may help us to do this. What better place to discuss these matters than at the splendid meetings to be held in Los Angeles Dec. 5-10?

There is some inquiry every few days for bees. From eight to ten and twelve dollars per colony is being asked, according to equipment, amount of stores, etc. More beekeepers now than in former years seem to be satisfied to continue in the business when short crops come. As one man put it a few days ago, we had the high prices during the war, and many of us acquired some very extravagant habits at the same time. This, together with the fact that we must accept lower prices for our honey, may work a hardship on some.

The Southern California Fair has come and gone, and as usual the Beekeepers' Clubs of Riverside, San Bernardino, and Orange Counties furnished one of the main attractions. Waffles and honey were served free in the Riverside booth and proved to be very attractive. San Bernardino County succeeded in carrying off the first prize this year, Riverside County getting second and Orange County third prize.

A meeting of beekeepers was held in Los Angeles on Nov. 4 and 5. It was well attended by apiarists from southern California counties. T. O. Andrews of Corona called the meeting to order and presided until the following officers were elected: Frank Buchanan, president; Geo. Emerson, first vice-president; J. W. George, second vice-president; A. B. Shaffner, secretary.

M. H. Mendleson gave a valuable talk on "Comb Honey," and Frank Buchanan gave a very good paper on "The Moving of Bees."

The forest ranger from the Los Angeles National Forest signified his willingness to co-operate with beekeepers and assist them in getting locations on forest reserve lands. All small tracts of any value as agricultural lands are usually owned by private parties. Yet there are some locations on the reserve that would be quite valuable and they could be reached by building roads.

The various Los Angeles supply houses had offered supplies to the value of $50 to the person suggesting a name that would be suitable for this new organization, but up to a late hour the committee was still struggling with the problem. L. L. Andrews.

Corona, Calif.

* * *

In Arizona.—The 1921 honey crop in the southern Arizona region is much below the average in quantity. The preceding winter was one of unusual drouth, and there was practically no spring nectar flow for building up the colonies. This condition was in marked contrast to the spring of 1920, when a fine flow from a variety of wild flowers brought the colonies to maximum size in ample time for the May mesquite-catsclaw flow. When the period of this flow came in 1921 the majority of colonies were not in the best of condition to take advantage of it, altho the flow was fair in quantity. Following the dry winter and spring the July-August rainy season was one of exceptional rainfall, the precipitation at Tucson amounting to 6.24 inches for July alone. August was also exceptional over the State in general. I anticipated a heavy second blooming of mesquite and catsclaw as a result of the favorable rains, but learned a lesson I shall not soon forget, viz., that superabundant moisture induces heavy vegetative growth with a minimum of reproductive activity. Contrary, then, to my expectations of a heavy flow, these trees scarcely blossomed at all during the period when second bloom may generally be expected, and there has been a dearth of nectar thruout the season since the May-June honey flow.

The same small apiary (nine colonies) at the University of Arizona, which last year produced more than 1000 pounds of honey, this year has produced barely 500 pounds. If any apiary in this section has produced more than 50 or 60 pounds per colony it is exceptional, while many beekeepers have secured almost no surplus.

In driving several times over a territory some 50 to 60 miles in extent during the rainy season it was noted that hardly more than one mesquite tree in fifty bloomed, while catsclaw bloom was a decided rarity. Such scattering mesquites as blossomed did so at irregular intervals and not at any one time, giving rise to the statement heard from some beekeepers that this plant bloomed three or four times. It is safe to say, however, that no one tree blossomed more than once in the summer season and most of them not at all.

One beekeeper has reported a satisfactory fall flow at his location, from an undetermined small flower. This must have been rather exceptional. Desert bloom (*Baccharis sarathroides*) has bloomed heavily, a little earlier than usual, but, in the vicinity of the University apiary at least, produced very little nectar.

Owing to the conditions outlined above, it is probable that many colonies are entering the winter period without adequate stores, and beekeepers will need to keep careful watch with a view to feeding when necessary.

Comb honey of fair to good quality is selling locally at 25c to 35c per section, and light amber and amber extracted is retailing at 55c per quart. Chas. T. Vorhies.

Tucson, Ariz.

* * *

In Texas.—The weather during October has been nearly ideal for bees over almost all Texas. The rains of September induced a blooming of many fall plants, and honey flows were experienced all over the State. No frosts have occurred as yet heavy enough to hurt even the cotton. As late as October 20 honey was still being stored as far north as Paris. In the southern portion the flow from como has just started. From west-central Texas comes a report of a good surplus from goldenrod and sumac. It is the general opinion that the bees are going into the winter in better shape than for years. As the price of honey was low, many Demuth feeders were left on the colonies. The honey plants are in fine shape. Broomweed gave its usual flow, and horsemint is coming in quantities sufficient to insure a blooming next spring. In the eastern part of the State boneset and asters were the origin of a good fall crop.

The depression of prices has had a queer effect on the bee game. Many of the men who for the past five years have made money on bees are discouraged because of the low price of honey and would quit if they could find a buyer for their bees. On the other hand, the old-timers are buying bees, and the farmers are turning to beekeeping as never before. For the first time the farmers of the South have realized that they must raise their own food, and a colony of bees gives as quick and large returns as anything they can have.

Competition occurs among all forms of life. Last year Dr. Merrill of Kansas gave a very interesting account of the loss of a honey crop because of the prevalence of flies on sweet clover. Thrips on alfalfa and mesquite often ruin a honey flow, and here in Texas a horsemint flow is often ruined by a yellow and black beetle which infests that plant. During the first part of this month a peculiar example of this occurred. This was not of much importance but was very interesting. A migration of the southern snout butterfly occurred across south Texas. Millions of these butterflies migrated from the Big Bend section of Mexico across Texas and out into the Gulf. Rockbrush was in bloom and the insects fed on it. Not only was every single flower occupied but the leaves and often the branches were covered with these highly colored butterflies. The bees seemed at a loss to know what to do, and it was amusing to see several bees trying to visit a flower and yet apparently afraid to do so because of the butterflies.

The apiary exhibit at the State Fair at Dallas, Oct. 8-23, attracted much attention. T. W. Burleson and W. K. Few of Waxahachie had very large exhibits. The entries for honey, wax, bees, cookery with honey, and displays were large.

The Texas Honey Producers' Association had a display exhibit, which was not entered for premiums. A large pyramid of bees appropriately lettered attracted much attention. This lettering was the work of C. C. Bee, who is a marble-cutter as well as a beekeeper.

Local fairs at Paris, Floresville, Kenedy, Belton, Manchester, and Seguin have had fine bee exhibits. The interest in beekeeping seems to be on the increase in spite of the low price of honey. This is especially true of western Texas, where sweet clover is being sown on irrigated land.

San Antonio. H. B. Parks.

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In Mississippi.—The Yazoo and Mississippi Delta is a strip of alluvial land in Mississippi which extends along the great river between Memphis and Vicksburg and which has an aver-

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age width of nearly 40 miles. According to the State Soil Survey, this land is exceeded in fertility only by that of the Nile River Valley. A few months back much of this land sold for over $500 an acre. Cotton is the main crop, and blacks predominate over the whites four to one.

For many years commercial honey production has been successfully carried on here. Writing for Gleanings in one of the latter years of the last century, Dr. Blanton of Greenville, Miss., referred to this wonderful section as a beekeepers' paradise. Extracted honey is produced, and until recently honey was shipped in barrels to St. Louis, Kansas City, and New Orleans. Cheap labor and large yields of honey made five cents a satisfactory price until the change in affairs was brought about by the World War.

During the war that five-cent honey sold from 17 to 22 cents. The big slump in business came in October, 1920. Honey, above all other crops, suffered because honey borders on luxury. The five-cent honey again became five-cent honey and was slow in moving even at that price. To make matters worse, both American foul brood and European foul brood had seriously reduced the average per colony yield. The beekeeper was up against a problem, for like the returned soldier who would not take back his old job at his former wage, the beekeeper was unwilling to accept the old price of honey.

The situation was ripe for organization. All the beekeepers in the Mississippi Delta, contiguous counties, and river counties south were invited to come to a meeting at Greenville on February 12. A large and representative crowd of beekeepers turned out. Those promoting the organization had prepared a constitution and by-laws that, with a few minor changes, were accepted. Officers were elected, dues paid, and a membership campaign launched. The Association pledged by a unanimous vote to assist the State Plant Board in their foul brood eradication campaign which was soon to begin.

Six weeks later another meeting was held at which a purchase and sales program was arranged. Dealers in beekeepers' supplies were present who agreed to allow liberal discounts to association members. The co-operative selling of honey was planned. A central bottling establishment was deemed impractical, and the members decided to operate individual bottling plants. It was agreed to adopt an association label. A four-ounce sample of each kind of honey extracted to be sold under the association label was to be filed with the secretary and approved by him before shipping. Each bottle was to contain a packer's paster on which each member was to place his number so that any honey could readily be traced to its producer. All honey was to be heated to 160°F. before bottling.

This association, like all kindred organizations, has had its knocks and bumps, delays and misunderstandings, and it was only by the utmost effort on the part of its officers that it was able to get ready to make its bow to the public at the Tri-State Fair at Memphis the last week in September. When they received their invitation from this Fair Association, including $150 for expenses and the privilege of selling honey on the grounds, their label was still at the engraver's and somewhere en route was a car of bottles. But they did get the stuff to Memphis and they put on a beautiful honey show. Incidentally, Delta Pure Southern Honey was introduced to over 1000 Memphis homes. As a result of this exhibit a chain grocery company made an initial purchase for the shelves of each of their stores, and one broker insisted that he be given the business of selling the Delta brand.

So these beekeepers have made a good beginning. They have their heating tanks, their floating thermometers, their labels, and packer's pasters, and they are ready for big business. At a recent meeting the Executive Committee elected to a levy a tax of ¼ cent a pound on all association honey, which sum will be used for follow-up advertising in the Memphis territory. Things may be slow at first and perhaps discouraging, but these beekeepers believe in themselves and the fine flavor of their amber honey, so that it looks as tho the old five-cent honey, all dressed up and having a new place to go to, is going to bring the desired results.

R. B. Willson.

Agricultural College, Miss.

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In New York.—The season's rainfall has been in streaks and spots, some localities getting plenty and others almost none. The lowlands of Lake Ontario suffered the worst drouth that can be remembered by even the oldest residents, with practically no rain from May until October. Orchards and well-cultivated crops showed but little injury, while uncultivated crops, such as oats, were a total failure. Clover, which was none too promising to begin with, made a feeble attempt at blooming and dried up without yielding any nectar at all, and was all cut and harvested early in June, a month earlier than usual.

There are a good many large apiaries, including a large percentage of our own holdings, located in this dry territory, which have yielded no surplus at all, and in the majority of cases feeding has been resorted to to supply the required amount of stores for winter. Some yards have done well on fall plants, such as goldenrod and asters, but in some localities these plants were entirely destroyed by the grasshoppers which appeared in great numbers, devouring everything that was at all green, even stripping wild carrot, and in some cases the leaves from trees. I saw one field of buckwheat with every plant eaten off, the remaining stubs sticking up over the field like so many little sticks.

Where these conditions prevailed brood-rearing was at a low ebb all summer and ceased entirely the latter part of September or very early in October, and the colonies are going into winter light in young bees. Where not fed, they are light in stores also, and in some cases with considerable honeydew from oak trees. If the winter proves to be severe there will undoubtedly be heavy losses. With clover practically annihilated by the drouth, beekeeping prospects are none too good for next year.

In contrast with these conditions, on the highlands above the Niagara Escapement and thru parts of southern and eastern New York rains were more frequent, with consequent better beekeeping results and in many instances record-breaking yields. Here the condition of clover and other honey plants was never more promising for another season.

To illustrate how these extremes exist, one of our own yards yielded an average surplus of 150 pounds, while another yard only five miles distant had to be fed the entire season. On the whole the honey crop in New York will probably average above 50 per cent, and where marketed to good advantage will compare favorably with most agricultural products. H. M. Myers.

Ransomville, N. Y.

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In Southern Indiana.—The season just closed has been very peculiar, in that it was one of great promise but small realization. It opened up fine, nice weather, so that the bees built up on the pear and apple blossoms. The fact that a freeze came later and killed practically all pears and apples did not matter to the bees, for their harvest was over.

In the early part of the season there was just the right amount of rain for all growing crops. The sweet clover blossomed in profusion, and there never was a finer outlook for fall flowers, especially smartweed; but after the bees were nicely at work on the sweet clover the rains quit and hot weather set in. The last of June the mercury ran up to 100 degrees and continued thru July, running from 95 to 103 degrees. The sweet clover was consequently cut short and the smartweed put out of commission. While the acreage of blue vine, or dry-weather vine as it is called, is not great, yet it seemed to enjoy this hot dry weather and gave a light but steady flow thru July and August. Extra-strong colonies stored some surplus, but colonies of medium strength built up into good, strong colonies thru it.

The failure of the fall flow left these colonies powerful in bees but light in honey. Many who did not feed will lose a large part of their colonies. However, colonies in large hives filled up on the sweet clover flow and are going into winter quarters strong in bees and stores.

Along the lower Wabash and the Ohio Rivers good crops are reported from the blue vine. This plant is not appreciated by many beekeepers as it should be, as in many seasons it yields just enough to keep up brood-rearing and to furnish a living for the bees. Consequently, as the honey does not appear in the super, many think they are getting no flow from it. If it were not for this plant, many colonies would consume all of their stores in the summer and curtail brood-rearing, so that if there was a flow from smartweed, the colonies would not be in condition to gather it.

When blue vine is left to mature in its own way, it blossoms in June. This year fully developed seed pods were found on the fourth of July. However, the main honey flow from this vine is in August. The reason this flow comes late is due to the fact that most of it grows in the cornfields. When the corn is cultivated the plant is cut off, yet it comes again and is again cut off; but when the corn gets too tall for cultivation, the blue vine has a chance and fairly takes the field. In this way the blooming period is retarded and prolonged, as some does not get cut off at all and some is missed at the second cultivation. It is a perennial, and when a root once gets established it is there for keeps. Jay Smith.

Vincennes, Ind.

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In Wisconsin.—One man produced 18,000 pounds of honey. He advertised it in his local paper at 12½c a pound and sold his entire crop in a very short time. Needless to say he does not belong to any association. A few other still larger producers are selling to the consumer 1 pound or 100 pounds at 15c a lb. They also act as independent individuals. Association members for 30 miles around these men have in the past asked from three to five cents a pound more. Association members found that many of their former customers autoed 30 miles to buy their honey from these men. The larger producers who were association members had honey to sell nearly the whole year at the higher prices. They found that year after year the natural demand for honey was seasonal the same as the fruits and vegetables have their seasons and a natural demand for them in season. After the season the demand could not be improved very much even with advertising, because the majority of the consumers buy enough in season to last them as long as they want it or until the next season. Right down in the bottom of his heart nearly every honey producer, large or small, is desirous of having his entire crop of honey sold before Christmas.

Co-operative unions are accused of being or becoming selfish and of taking all the traffic will bear for the necessities of life. The producers who are independent of organized groups of producers have to a large extent established honey prices this season, except that association members ask 20% more in less than 5-gallon orders. This, of course, is competition in prices. We may be safe in saying that these prices were established without actually knowing the cost of production and distribution. The very small and the very large producers can and ought to produce honey cheaper than the middle-sized producer.

With half a crop locally here and a price of 15c in 5-gallon lots and 18c in smaller lots, all of our association members will be sold out before Christmas. The demand was extra good. The price was not too high. Those men who asked less than we did are just that much out. It would have paid them hundreds of dollars to be members of an association, and they would not be obliged to be feel guilty of holding up the consumer with too high a price. Every association needs the aid of these men who refuse to come in just as much as they need the aid of the association. These men should help build up the associations and help guide them in their policies and in the adjustment of prices that are just and fair to both the producer and consumer.

Greenville, Wis. Edw. Hassinger, Jr.

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In North Carolina.—President Bruce Anderson and his board of directors have called the North Carolina State Beekeepers' Association to meet in annual session at the North Carolina State College of Agriculture and Engineering on Tuesday, Jan. 10, the convention to continue thru Wednesday, Jan. 11. The college has a model apiary maintained under the direction of J. E. Eckert, instructor in apiculture, and is also accumulating a valuable and very instructive collection of the latest and best things in beekeepers' supplies. With this excellent apiary and "Museum of Apiculture" at hand the officers of the State Association of beekeepers believe that Raleigh will prove an especially advantageous place for this annual convention.

One of the special matters to come up in this convention will be the changing of the constitutional time for these annual meetings from the second Tuesday in January to August so that the meetings can be included in a national chain or series of State conventions being scheduled under the auspices of the American Honey Producers' League. This would, under a tentative schedule already prepared, give the North Carolina Association a convention August 9 and 10, 1922. There is a very general sentiment to make this change, as it will then be possible to have speakers of national and international reputation for the State conventions, not otherwise easily obtainable.

Rapid development in beekeeping in this State is indicated by the fact that in spite of almost the leanest honey year in the history of the State, the Bees and Honey division of the State Fair at Raleigh was characterized by fine exhibits constituting displays many times more extensive and meritorious than ever before gotten together in this State.

Reports from practically all sections of the State where beekeeping has any foothold indicate that bees are entering the winter season in much better condition than was expected after the early frosts and the fall droughts so terribly reduced the honey crops for the season. However, feeding is necessary in some quarters, and beekeepers generally are giving exceptionally careful attention to this important matter. Many beekeepers, especially in the northeastern section of the State, report considerable commercial honey crops from the fall flora such as goldenrod, wild aster, and others. In the Piedmont, or central part of the State, while these flowers were very profuse, the dry weather greatly reduced the flow of nectar, in many instances bees being found in an actually starving condition in the midst of an abundance of such flora.

Wilmington, N. C. W. J. Martin.

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In Ontario.—Following a month of weather milder than usual for this time of the year, November has come in with a wintry aspect, and today (Nov. 10) the ground is covered with a snowy mantle. For the first time in our beekeeping experience we have been caught by cold weather before the bees were all prepared for winter so far as packing is concerned.

We had nearly 300 new winter cases made to accommodate a lot of bees hitherto wintered inside, and delay in getting the cases, coupled with more than the ordinary amount of fall work, kept us later than usual. Then the early cold weather and heavy fall of snow came as a climax, and found us with some 150 colonies still minus the planer shavings needed for top packing.

Fortunately all hives had been placed in cases, and the sides and ends all packed before the snow came, but it is bad enough

FROM NORTH, EAST, WEST AND SOUTH

as it is. Today we took a truck-load of shavings to the apiary not yet entirely packed—a drive of nine miles—and when we got there we found a deep cut in the road where we go in to the place, all filled up with snow—too much snow in fact to shovel out in time to attend to work and get home before dark. So another road had to be made across a field after opening up two fences. Fortunately teams were working near the place and I was able to get the driver of one of them to hitch on the front of our truck and give us a haul of about 40 rods up to the apiary. But working in snow packing the bees is not to my taste, and I say, "never again." Wet feet, cold hands, and other unpleasant features accompany the work under such conditions, not to mention anything about the bees which would be better left alone without the disturbance that is caused, no matter how careful we are in taking off covers of winter cases and putting in packing.

The demand for honey still surpasses anything we ever had in this part of the country before. Two stores that each bought from us a carload of honey, which was delivered in September, have already asked us for more honey like the previous order, and we were, of course, unable to supply them. No doubt they will be able to get honey all right, but I simply mention this to show what heavy sales the retail stores have made, not to mention the honey sold direct to consumers by the beekeepers. Bees that are to be wintered inside here in Ontario, as I have already intimated, are covered up with snow at the date of writing. We will have only 65 colonies in the cellar this winter; so, with only 5% of our bees inside, naturally we will be more concerned as to conditions which affect outside wintered bees this season. J. L. Byer.

Markham, Ont.

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In Porto Rico.—To understand the varied conditions existing in Porto Rico, it is necessary to have a birds-eye view of the entire island, which is a part of the chain of islands which reach out in a southeasterly direction from Florida, known as the West Indies Islands. It is only about 100 miles long and 30 miles wide. Most of the coast line is flat. This flat land varies from a quarter of a mile to about a mile in width. All the remainder is composed of high hills, one of which reaches an altitude of over 4,000 feet above sea level. These hills roughly divide the island into a north and south watershed. The north side receives an average rainfall of from 70 to 100 inches annually, while the south side seldom receives one-third of this amount.

The small island has, therefore, many different aspects—wet and dry, plains, highlands, and deep valleys. Within a distance of less than five miles one can frequently find lush verdant vegetation and ground that is sunburnt until all vegetation seems dead—trees without leaves, and grass and small shrubs burnt dry and brown. When sufficient rain falls to renew life, then it comes jumping with incredible swiftness. A week later all is green, with trees in leaf and flowers budding. With these varied conditions from month to month, and year to year (as there is no sure rainy season), it can readily be seen that at a given time what will apply to the north coast will not apply to the south coast and what will apply to the hill country will apply to neither. In this respect there is a similarity between California and Porto Rico, despite the enormous difference in amount of territory.

With these varied growing conditions, the blossoming period is not alike all over the island at a given time. It would be correct to say there is a constant bloom of nectar-yielding trees on the island. When this localized bloom is over, another part of the island takes up the work, and so it goes from month to month.

Owing to the hilly contour of the ground, it frequently happens that two apiaries may be within a mile of each other, and yet the bees from the two yards in their flight will not lap over the same territory. This condition is caused by the high-wooded hills, and no doubt the trade winds play their part in limiting the flight. The bees work up and down the valley in which they are located and range near the summit of the hills, but seldom go over the top.

When Porto Rico was taken from Spain in 1908, there were practically no honeybees or beekeepers to be found. About 1909 the Mayaguez Experimental Station, supported by the U. S. Department of Agriculture, introduced the Italian bees and the modern 10-frame hive. Five years later there were several thousand colonies of bees on the island in modern hives, most of these being owned and operated by the native Porto Ricans. During the latter part of the World War, the honey produced was sold for as high as $2.00 per gallon. These high prices so stimulated the sale and increase of bees that today many parts of the island contain so many colonies that no honey is being stored and quite a few apiaries are at the point of starvation much of the time. These conditions give little promise of large yields or prosperous beekeeping. It is to be hoped in the future there will be an equalization of bees to the possible honey production. This will allow a maximum production of honey, but will probably cut down the number of colonies by a third.

Aibonito, Porto Rico. Penn G. Snyder.

HEADS OF GRAIN FROM DIFFERENT FIELDS

Beekeeping on Cape Cod. It is remarkable in what curious and unexpected places one finds bees and beekeepers. Having heard of Cape Cod as being a succession of sand dunes, especially at the outer extremity, I had not expected to find any bees at Provincetown, the first landing place of the Mayflower in 1620. Soon after my arrival from Boston, on the Dorothy Bradford, July 25, I walked down a little lane between buildings, to the water front. It was lined on each side with old-fashioned flowers, in which the hollyhock was conspicuous. The Provincetown people believe in flowers, which add much to the beauty of the quaint old place with its narrow streets and old cottages. At the end of my walk I noticed a little patch of sweet clover in bloom. A large number of insects were busy on the blossoms, and I looked carefully for honeybees. Sure enough, there were several fairly well-marked hybrids. I lost no time in making inquiry as to who kept bees. I soon located John F. Francis, a heavy-set genial fellow, who has a barber shop on Main street. It did not require a long time for us to become acquainted, and thru Mr. Francis I was able to learn about the beekeeping possibilities of that part of Cape Cod. Mr. Francis keeps only a dozen colonies, as he thinks that number is about as many as the field would profitably support. Even with that small number, he keeps a ''Honey for Sale'' sign in his window. At one time his sign read ''Honey in the Comb''; but as a comb is used in the barber trade, the sign attracted the attention of some hunter of the curious in signs, and was written up in the Boston papers.

These sand dunes are covered in many places with a heavy growth, including oak, jack pine, cherry, soft maple, beach plum, grapes, huckleberries, blueberries, and other undergrowth. The honey source was stated to be as follows: beach plum, wild cherry, cranberries, blackberries, sumac, and, in the fall, much goldenrod. Is it not remarkable that beekeeping is so widely spread in our country? The question is not where can bees be kept, but where are the places in which they can not be kept?

Provincetown, Mass. Harry Lathrop.

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Sumac Bobs For Smoker Fuel. Sumac bobs are cheap, easy to get if you live where they grow, and make more smoke to the pound than anything on earth ever put in a smoker. They last longer and never flame up. Puff as hard as you please, and all you get is a cloud of white cool smoke less the bad smell that you get with rags or many other things that beekeepers usually use. Every beekeeper that has seen them burn says they beat anything else he ever saw. One of the inspectors now carries a bagful along for smoker fuel. Just plain sumac bobs, the seed of the sumac, last year's tops, are the part to use. John N. DeMuth.

Pembroke, N. Y.

Sand dunes on Cape Cod, near Provincetown, the first landing place of the Mayflower in 1620. Even here the honeybees are able to make a living.

HEADS OF GRAIN FROM DIFFERENT FIELDS

Seven Supers of Honey from Fall Flowers. This season has been a very prosperous one in this locality except that the swarming was late, principally in the latter part of June and continuing to the middle of July and even as late as September. I had one colony start swarming on September 2nd. It filled its 10-frame hive by the 14th of September and started in the super. We had an unusual fall crop from smartweed and aster. Some of the fields were white and blue with aster. I never saw so much before and it seems to be increasing every year. There was also an abundance of goldenrod, but the bees of this county don't seem to work on it very much. I had one colony that gave me over seven supers of fall bloom honey which is light colored and fine. My bees are all going into winter quarters heavy in stores.

Julian, Pa. W. S. Williams.

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Beekeeping in the City of Rome. I find here among my papers the address of a prominent Roman beekeeper, who has an apiary on top of a five-story building in the center of Rome. Large potted lemon and orange trees provide shade and act as swarm-catchers. On the floor below he has a large laboratory where he makes experiments for the government. The walls are hung with hundreds of medals and diplomas from all the prominent cities in Europe. I spent a most pleasant day with him, conversing in broken Italian on my part and broken English on his. His name is Cav. Prof. Antonia Costantini, Direttore del R. Osservatorio di Apicultura, Rome, Italy.

I was directed to him thru the Italian Minister of Agriculture on my return from the Balkans in 1918. He lives on the fourth floor of a mediaeval building on one of the most busy and crowded streets of Rome.

After I introduced myself, the good man became intensely interested to learn the latest developments in American beekeeping. I had a most pleasant chat with him in my broken Italian. Mr. Costantini is a most remarkable man of about 55 years of age. His modesty restrained him from talking about himself, but the walls of his office gave evidence of great bee activities in his past years. All the available space on his walls was taken up with diplomas, gold, silver, and bronze medals from all over the world, including one from the Exposition in Chicago, also ribbons and badges from beekeepers' societies, and several orders.

A small staircase leads from his office to the roof of the building where he kept an apiary of about 70 colonies. The size of the roof was about 75 x 150 feet, surrounded on all sides by a wall about four feet high. The apiary is divided by streets and avenues into several blocks. In the midst of each block grows a fair-sized orange tree in a tub. There is also an alley of orange trees and lemon trees along the four walls, furnishing abundant shade for the apiary. The beehives are arranged symmetrically in each block with a space between filled with potted plants, such as almonds, fig trees or shrubs, bay trees, palms, etc. The hives are placed on low stands just convenient to handle. They are his own make, resembling closely eight-frame Langstroth hives.

His system is modern and up to date, with frames all wired horizontally and vertically. The bees are the dark leather-colored variety, almost red. They were very gentle, and at the time I was there (October) had a brood-chamber and one super completely filled with brood and honey, altho the honey had been extracted twice during the summer. Mr. Costantini's research work in 1918 was principally along the lines of increased production of honey for the war. His bees have to travel from two to three miles toward the Sabine Hills where they have their principal pasture outside of the rather extensive parks and gardens of the city of Rome.

St. Paul, Minn. Francis Jager.

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Does Pollination Stimulate Growth of Fruit Body? There is a general belief that the development of seed inside the fruit-body unconditionally influences the development of the fruit-body itself. That this is not so, can be seen from the seedless orange, the seedless tomato, and the banana. In none of these instances are seeds desired, but the development of the fruit-body takes place all the same in consequence of the pollination.

St. Thomas, V. I. Alex Holst.

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Bees as Pets. The term "pets," as applied to bees, has always seemed to me incongruous—"pet" conveying to my mind the idea of something to be fondled and caressed. I have, however, been converted to believe that bees may be pets.

A friend of mine who recently acquired a colony of bees is very enthusiastic over her new acquisition. She is often heard to remark: "I do love my bees." During the very warm weather when the bees clustered out evenings, she would go to the hive and actually pet her bees, passing her hand over the cluster as tho it were the back of a cat (tho, of course, more lightly), and then remark, "Oh, they are so nice and soft!" And this despite the fact that when her bees swarmed she was stung five times on one foot. Magdalen Sproull.

Freeport, N. Y.

GLEANED BY ASKING

Geo. S. Demuth

QUESTION.—How much of their stores will colonies of normal strength well protected by winter-packing cases consume up to the time when brood-rearing first begins in the spring?
Indiana. John Longaker.

Answer.—Colonies which are well protected and supplied with stores of good quality should not use more than 12 to 15 pounds during the broodless period in your locality. If conditions are favorable they should consume less. In fact, strong colonies should be able to live during the broodless period on one and one-half pounds per month. Much depends upon the character of the winter and the quality of the stores. If the stores are of the very best, such as heavy granulated sugar syrup, straight and well-ripened alfalfa or white clover honey, much less will be used than when the stores are not so good. Sometimes the amount used by colonies having the best of stores is less than one-half the amount used by colonies of the same strength but having inferior stores.

SYRUP CRYSTALLIZES IN THE COMB.

Question.—I fed my bees a heavy sugar syrup two parts of sugar to one of water, using tartaric acid in making it, but on looking in the hives I find the syrup has crystallized. What can be done now? Frank B. Moore.
Missouri.

Answer.—The bees will, no doubt, be able to use this syrup in your climate even tho it is partly crystallized, but in doing so they will waste a part of it by throwing out the hard crystals while digging into the cells to take the liquid portion.

In making the syrup you probably did not keep it hot long enough after adding the acid. Since the acid can act on the sugar only when heat is applied, it is necessary to keep the syrup near the boiling point for some time after adding the acid. Again, it may be that you did not use enough acid. A level teaspoonful for every 15 to 20 pounds of sugar is the amount usually recommended. In some cases it is not necessary to use acid in making syrup to prevent crystallization, especially if the colonies are strong and are well packed at the time the syrup is fed.

REMOVING SUPERS OF HONEY AT BEGINNING OF WINTER.

Question.—Would it be unwise to take off two supers of comb honey from one of my hives this late in the season? William Wordsworth.
New York.

Answer.—If the bees have enough honey in the brood-chamber for winter the two supers of comb honey should be taken off; but if there is any question about there being sufficient stores below, it will be better to leave one of them on the hive, unless you have some combs of honey to give them for winter.

If the bees are well equipped with stores in the brood-chamber they will cluster below during the first cold weather leaving the supers free of bees so they can easily be taken off any cool morning; but, if there is not much honey below, the cluster of bees will extend at least into the first super. If one of the supers of comb honey is left on the hive for winter stores, of course the sections will not be fit to use again for comb honey, but it will be better to sacrifice the comb honey rather than let the colony starve.

BEES USE EXTRA STORES WHEN DISTURBED BY MOVING.

Question.—My colonies now have 25 pounds of honey each for winter, and I want to move them 24 miles to a new location. Will the disturbance of moving cause them to consume so much of their honey that they will not pull thru the winter?
Washington. L. M. Brown.

Answer.—The bees will not consume much of their winter stores because of moving at this season, certainly not enough to put them in danger of starvation. At first when the colonies are loaded for moving some of the bees will fill their honey-sacs, and of course a part of this will be consumed, but before the journey is completed the bees will quiet down somewhat and no doubt put most of the honey back into the cells. At other seasons the disturbance from moving would be greater, causing the bees to consume more honey. It will be necessary for you to examine your colonies early in the spring to see if they have enough stores, for while 25 pounds should be plenty for the broodless period of winter, when spring brood-rearing begins they will need more unless they can gather a supply from early spring flowers. Many beekeepers now leave 40 pounds or more for each colony for their winter and spring supply, but of course you can give the additional supply if needed in the spring.

MEDIUM COLONIES REAR BROOD LATER.

Question.—In preparing my bees for winter I find some of the medium-sized colonies still have emerging brood, but the strongest ones do not. Is this an unfavorable condition? A. E. Trapp.
Montana.

Answer.—It is quite natural for weak colonies to rear brood later than the strong ones. In fact very weak colonies may be expected to rear brood during the winter, while the strong ones remain broodless until the normal time for brood-rearing in the spring. No doubt your medium-sized colonies were following the normal behavior of weak colonies in this respect, thus continuing brood-rearing a little longer. If their last-emerged bees can have a cleansing flight before winter begins, the additional young bees will be beneficial to these medium-sized colonies.

LEAVING SUPER OF HONEY FOR WINTER.

Question.—My bees have filled a shallow extracting super but have not drawn out quite all of the frames of foundation below. They could all go into the lower hive-body for winter, but there is not enough honey below for winter. Should I leave the shallow extracting super on all winter?

Ohio. C. G. Wilmot.

Answer.—Yes, by all means leave this honey with the bees. Of course it would be easier for the bees to keep the regular brood-chamber warm during the winter than to keep both chambers warm, but you can overcome this disadvantage by protecting the hive better by winter packing. You can take out the empty combs and frames of foundation from below and fill the space with chaff-cushion division-boards to reduce the space in the hive for winter, but as soon as more room is needed in the spring it should be given.

FRAMES OF FOUNDATION BELOW FOR WINTER.

Question.—Will it be well to put a hive-body filled with frames of foundation under each brood-chamber to make the hives two story, so that when the bees fill the upper story with brood in the spring they can go below?

Iowa. P. H. Dunn.

Answer.—No. This extra story should not be given until spring. If frames of foundation were given now the foundation would be more or less damaged before it could be drawn out next season. For best results the foundation should not be put into wired frames very long before the bees can draw them out into combs. Furthermore, next spring the bees would be slow about drawing out foundation under their brood-combs. It will be better to wait until the bees need more room next spring, then put the new hive-body on top, at the same time transferring one or two combs of brood from the lower story into this upper story to induce the bees to begin work on the foundation promptly.

LOCATION OF HONEY FOR WINTER.

Question.—In using five full frames of honey in the upper story together with four or five empty combs, should I place the combs of honey in the middle of the hive or on one side or would it be better to alternate them?

Ohio. Bernard Kunz.

Answer.—The frames of honey should be directly above the cluster, so that as the bees use the honey they can move upward as the honey is consumed thruout the winter. Since the bees usually form their winter cluster where the last of the brood emerged in the fall, the stores in the upper story should be above the fall brood-nest, which is usually in the middle of the hive. It would be better not to have combs entirely empty in the upper story. For this reason some prefer to use shallow extracting supers for the extra supply of stores.

RIM UNDER BROOD-CHAMBER FOR WINTER.

Question.—Will bees winter better in the cellar if a two-inch rim is put below the brood-chamber and the entrance contracted to ⅜ inch by 3 inches?

New York. F. M. Doty.

Answer.—Formerly it was thought to be necessary to have a deep space below the frames for winter to afford better ventilation and furnish a place for dead bees, but in a warm dry cellar this is not necessary.

WINTER ENTRANCE IN TARRED PAPER PACKING.

Question.—Should the regular hive entrance be contracted when the bees are in tarred paper, as described on page 618, October issue of Gleanings, a ⅜ by 2-inch hole being cut thru the tarred paper for an entrance? Clay Dunkin.

Indiana.

Answer.—It is not necessary to use the entrance stop when bees are packed as described on page 618, for the tarred paper covers the entrance completely. In the spring when a larger entrance is needed the hole thru the paper can be enlarged as desired.

CARE OF EXTRACTING COMBS IN THE SOUTH.

Question.—Should I remove my extracting-combs for winter? If so, how can I protect them from the wax moth larvæ? Max Wennenweser.

Texas.

Answer.—In the tropics the safest place to keep the extracting-combs is on the hives where the bees can take care of them thruout the year. Perhaps in southern Texas this is the best plan, tho wherever the weather is cold in winter the extracting-combs should be taken off the hives and stored until spring in order to keep the bees warmer during winter. If the combs are exposed to freezing temperature for a few days the moths will be killed, and the combs are then safe until spring unless more eggs are laid among them. In warm climates where freezing temperatures can not be depended upon to keep down the moths they can be controlled by fumigation. To do this pile the supers of combs in tight piles, five supers in a pile, and on top of each pile in an empty super place a dish containing two ounces of carbon bisulphide and cover the pile tightly. This should be repeated after two weeks, after which the pile should be kept covered so no moths can enter.

SMALL NUMBER OF BEES IN FALL.

Question.—Why should my hives be heavy with stores and the bees small in numbers this fall? Is it possible that skunks have killed off the bees?

New York. Clarence T. Bullock.

Answer.—It is natural for the colonies to become smaller as winter approaches, especially if there is a fall honey flow which causes the older bees to wear themselves out and die before cold weather. Usually the strongest colonies will not have more than three or four pounds of young bees at the beginning of winter. They may also have several pounds of old bees at this time if they have not worn themselves out searching for nectar in fall flowers, but the real strength of the colonies at this time is largely in the young bees. If the old bees have disappeared because of hard work late in the season, the colonies are still strong since the remaining bees are young. The skunks may have killed off many of the bees, but it is probable that the reduction in numbers which you noticed is the natural reduction of the colony for winter.

JUST NEWS

Editors

THE annual convention of the Indiana State Beekeepers' Organization will be held in the State House at Indianapolis on Dec. 15 and 16.

The Illinois State Beekeepers' Association will hold its annual convention in Springfield, Ill., on Dec. 14 and 15 at the St. Nicholas Hotel. G. M. Withrow, Mechanicsburg, Ill., is secretary.

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The Wisconsin State Beekeepers' convention will be held Dec. 8 and 9, at Milwaukee auditorium, Milwaukee. Write for program to H. F. Wilson, Beekeeping Section, University of Wisconsin, Madison, Wis., who is secretary.

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The annual meeting of the Chicago Northwestern Beekeepers' Association will be held in Room 1811, Hotel LaSalle, Chicago, on Dec. 5 and 6. Routine business will be disposed of on the forenoon of Dec. 5, after which E. S. Miller will give his report as delegate to the American Honey Producers' League. In the afternoon of this day there will be addresses by E. W. Atkins and S. B. Fracker, and on Tuesday E. R. Root, Jay Smith, and G. H. Cale will address the meeting.

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An effort to reorganize the Ohio State Beekeepers' Association as a federation of county societies will be made at the annual winter meeting to be held during Farmers' Week at Ohio State University, Columbus. The officers and executive committee of the association are urging all beekeepers to be present at the winter meeting when this important matter of new organization will be decided.

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The second annual meeting of the American Honey Producers' League will be held Jan. 30 and 31, 1922, in Salt Lake City, Utah. The Utah beekeepers promise the members of the League "the time of their lives." Every beekeepers' association, whether a member of the League or not, is urged to send a representative to this convention. "Honey and How to Use It," the recipe book put out by the American Honey Producers' League, is free to any one asking for it. The secretary of the League is H. B. Parks, whose address is Box 838, San Antonio, Texas.

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F. B. Paddock, State Apiarist of Iowa and Secretary-treasurer of the Iowa Beekeepers' Association, is doing excellent work for the beekeepers of his State. He is the moving spirit in the twelve-weeks' winter course extending from Jan. 2 to March 22, 1922, in beekeeping, at Iowa State College of Agriculture. He has arranged this major course covering the twelve weeks, to give a thorough exposition of beekeeping in all lines, and also a course in beekeeping for those specializing in either horticulture or poultry husbandry, preparing those who take this minor course to undertake beekeeping on a small scale or sideline. Mr. Paddock is also largely responsibile for the large membership of 625 enrolled in the Iowa Beekeepers' Association. The annual meeting of this association will be held Dec. 15 and 16 at Waterloo, and a very interesting program is promised. The Iowa State Association placed 114 orders for its members during the past year, amounting to $5100, and effected a saving of $1300 by so doing.

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The New Jersey Beekeepers' Association will hold its annual convention in Trenton, N. J., on Jan. 12-13, 1912. J. E. Crane of Middlebury, Vt., and Messrs. Stewart and Bedell of New York will be on the program as well as other interesting speakers. The annual dinner on Thursday evening will be a very enjoyable occasion with Hon. Emmor Roberts, State Senator for Burlington County, as toastmaster.

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Among the speakers on the program of the annual meeting of the Michigan Beekeepers' Association to be held at Lansing, Mich., Dec. 1-3, are Russell H. Kelty, Elmer T. Beach, G. H. Cale, J. W. Stine, Prof. H. F. Wilson, Dr. Ernest Kohn, E. A. Little, E. S. Miller, and Geo. W. Dial, manager of the Michigan Honey Producers' Exchange. The annual banquet is slated for 6:30 p. m. on Friday, Dec. 2.

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For the first time since 1918 the Massachusetts Agricultural College is able to be of service to beekeepers of the State. This fall Assistant Professor N. E. Phillips was appointed to the staff as instructor in beekeeping, and has written a new correspondence course in beekeeping, which is a thorough and systematic study for the beginner with bees. The college is able to offer this course to persons interested in beekeeping at the same rate as its other correspondence courses, $2 for enrollment fee. The course may be started at any time during the winter and continued as the time of the student permits.

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Beekeepers in the famous fruit belt of Yakima Valley, Wash., reckon their honey crop at a million pounds this year.

BEES, MEN AND THINGS

(You may find it here)

"LAST summer while watching my bees I noticed a bumblebee enter the hive. I sat there and watched. After one or two minutes out came a bee, landed on the board, spun around on its side and died. I counted 25 bees do this, then no more came. I opened up the hive and Mr. Bumblebee was dead on the floor."—W. Stoddard, Essex County, Mass.

"As we wrote you a few days ago the peddling of near-by-production honey has been a big obstacle this season in booking orders among the dealers. Our city market on the north side of the city is flooded with all kinds of extracted and comb honey for sale, and the writer only recently made a personal survey of seven or eight of our large down-town stores and found they are fully loaded. We are in hopes this situation will clear up before long, after which we know the business on Airline honey will come in heavier than it has during the past few months."—Geo. A. Mendes & Co., brokers and packers' agents, New York City. (Gleanings has never before so strongly advocated the selling of honey locally as during the fall of 1921. This advice seems to have been taken by a great many beekeepers and to have worked well. Mendes & Co. give eloquent if not cheerful testimony in the paragraph quoted above.—Editor.)

"On page 707, November Gleanings, E. M. Cole mentioned the name 'crystallized' for candied honey and 'liquid' for extracted. Why not name them comb honey, combless honey, crystallized honey?"—Morris Aaroe, Warren County, N. J.

"As to your editorial regarding honey labels, etc., referring directly to the idea of leaving off the word 'extracted': Close observation in handling large quantities of honey during past years, indicates to us that it is a wise plan. Very many merchants advertise honey as 'strained' honey. This practice we have fought from time immemorial almost, but never advocated leaving out the word 'extracted,' however good the idea may be. You will observe that our labels do not have the word 'extracted' thereon."—G. W. Bercaw, Manager of Aliso Apiaries, Los Angeles, Calif.

"The following is an interpretation of the net weight law in Michigan as applied to comb honey: 'The Michigan Department holds that in the case of comb honey it is legally stamped, provided the producer ascertains the weight of the lightest section (in the case) and then on each section states plainly that the minimum weight is so much, stating the actual contents, exclusive of the wooden portion, in such lightest section.' Relative to the selling of comb honey by the section instead of by weight, the opinion is that 'an agreement between the buyer and seller to purchase comb honey by the section instead of by the pound is entirely legal.' "—B. F. Kindig, Lansing, Mich.

"What about a winter nest of empty cells for bees to cluster on, I hear some one say. As many know, I do not for a moment believe that enough empty cells are necessary for bees to cluster on; in fact, I might say that I know that such is not the case. I have tested the matter out thoroly, and I happen to know that the most of the extensive producers in Ontario entirely agree with me on this question. In the October issue of Gleanings, page 617, Mr. Demuth well says, 'There is greater danger in having too many vacant cells than in having too few;' and I have always maintained that a big winter nest is the cause of more winter losses than all other causes combined." J. L. Byer, Markham, Ont.

"We have undoubtedly the best bees in the world, and we produce very fine qualities of honey; but we have only a few beekeepers, and in many places in Italy, especially among country people, bee culture is just what it was some centuries ago. We have also some very skillful beekeepers and several good bee journals; but beekeeping has not been as widely diffused as it should have been, as our government does nothing for it, and associations and bee journals are not sufficient for the purpose."—Luigi Scazzola, Genoa, Italy.

"I have learned that the sun will kill bees. I had in my yard three colonies of hybrids and wanted to requeen them, so secured three good Italians and started to requeen by taking one of them out in the yard and putting the cage on an old winter cover. I then removed the black queens and put them in Miller cages by the side of the new queen. I then proceeded to go thru the hives for any queen-cells that might be present. To my great surprise, when I turned to get the new queen, the whole lot was dead, the new queen and all her attendants as well as the queens I had removed."—T. Bartlett Bragg, Hillsborough County, N. H.

"I wonder what kind of ruler the folks who say that a bee line is a straight line have been accustomed to use. My bees remind me of Saturday night in days gone by. But if a law-abiding bee's line is a straight line where do you suppose my bees are getting it?"—Rogert Davis, Oxford County, Maine.

OUR HOMES
A. I. ROOT

Lord, what wilt thou have me to do?—Acts 9:6.

Behold, he prayeth.—Acts 9:11.

I say unto you, Love your enemies, bless them that curse you, do good to them that hate you, and pray for them which despitefully use you, and persecute you.—Matt. 5:44.

IN Our Homes for September I told you how I stood up in public and announced that from that day and hour I was going to work for the Lord Jesus Christ first, and for self second. During the night there was a mental debate as to what or how I should undertake to carry out the new program.

At that time I was a jeweler and watch repairer. My store was, as a rule, opened with the very first places of business on the street; and it was a good deal the fashion for the merchants clear along up and down the street to be out early with their brooms sweeping the pavement. My next-door neighbor was a grocer, and we were quite well acquainted. As we both stood there, with broom in hand, I said:

"Alec, you want to come out to the meetings we are having in the different churches."

The man with a broom on the other side of my place of business came up and said:

"What is that you are saying, Mr. Root?"

I told him I was inviting my neighbors, right and left, to come to the meetings we were then having, and pretty soon a crowd gathered around us. The fact that A. I. Root, who had scarcely entered a church or Sunday school for years past was out inviting his friends "hither and yon" to come to church, was an innovation. Pretty soon somebody said, "You want them to come to *your* church, of course."

Now, even if I had not been a churchgoer, I am glad to tell you that Mrs. Root and the two children were always promptly on hand both at church and Sunday school. Well, in response to the above hint (that of course I was working for the Congregational Church), I replied:

"No, no! Come to any of the four churches in our town."

Then somebody said, "Oh! that is too thin. Of course you are all working for your own church."

Then they began to banter me. My next-door neighbor finally said:

"Mr. Root, if you will get all four of the preachers in our town to stand together like brothers in one pulpit *I* will go to church." Others in the crowd said, "And I," "And I," "And I."

Then there was a lot of merriment to think they had cornered me; for away back in those times churches did not stand together as they do now—that is, in most places. But I accepted the challenge. I told them we would do that very thing, and added that I would hold them to their promise to come, and I think I dropped business and everything else and startdd out to visit our ministers and tell them of the challenge. They replied smilingly that they would take great pleasure in doing just that very thing. Well, dear friends, from that day on I have had many wonderful answers to prayer, and many of them have been *swift* answers. In looking back and reviewing it I do not wonder that my faith has never once failed; and it has just occurred to me, that before I go down to my Florida home, where I have no stenographer, I had better leave here an account of some of those wonderful answers to prayer of years ago, to be used in case there should be no Home paper forthcoming for the winter months.

Today is Oct. 4, and we expect to start for our Florida home in just two weeks. Well, now for my first experience in prompt answers to prayers.

Three of our ministers acquiesced at once. The pastor of the fourth one lived out of town about half a mile, and I started out with enthusiasm to see him. To my great disappointment, however, this fourth pastor declined; and he said, furthermore, that if I had been at all acquainted with the tenets of his denomination I would have known better than to promise the crowd as I had done. I did not give up easily, and I urged until he finally got up, and, I think, buttoned up his coat, suggesting by the act, I took it, that I could not take any more of his time. In fact, I felt that I had been "snubbed," to use a slang phrase. Now, I had gotten a little religion at that time, but not enough so but that my temper came up. I think, to call things by their right name, that I went down the steps just a little "mad." But I was not vexed enough to keep myself from remembering the Bible promises I had just been going over so gladly. I began to pray; and, by the way, good friends, if there is *ever* any time when you ought to pray it is when your temper is coming up. As there were then no houses, or at least but few, between the parsonage and the business part of the town, I prayed out loud; and from that time on, when I have been greatly interested in some particular matter, I have been in the habit of going out into a cornfield or somewhere where I could talk out loud and tell the dear Savior my troubles and what I wanted. Cement sidewalks had not been invented away back in those days. Our walks were all made of boards; and while I was praying something as follows, "Dear Lord, you see how I have utterly failed, and, will you not take that mistaken servant of thine in hand and make him see how much the good of our town and community demand that he should change his mind?" While I was talking I heard the sound of heavy footsteps along the board walk, coming up behind me. As I turned about one of the officers of the church came up, and, placing his hand on my shoulder, said, "Mr. Root, our pastor has asked me to catch you, if possible, before you reach town, and say that he has reconsidered the matter you presented, and that he will acquiesce in what you proposed, and will do his best to make the meetings a success."

There you have it, dear friends—one of my first surprising answers to prayer.

At the time appointed, our four ministers sat side by side in the pulpit of one of our churches. Rev. A. T. Reed, the "boy preacher" I have told you about, opened the meeting, and then said to me, "Mr. Root, we four pastors of the churches of Medina with this goodly audience are here ready to do your bidding. Each one of us cannot preach a sermon. What is your suggestion?"

I asked them to preach four sermons each ten minutes long. I think the good friends on the sidewalk, who promised to come to such a meeting, kept their promise; and as it was pretty well talked thru our town, there was a large audience present. There was a big revival and these union meetings have been kept up more or less from that time to this. When the weather is suitable we often have our meetings on the park in the center of our town.

Only a few doors from my own store there was another jeweler, a younger man than myself. He and I had been in a jangle as to who had the best goods at the lowest prices. This jangle had got into our county paper, and I am afraid we had been calling each other names. I once apologized to the editor for some statement that I wanted in, and he replied something like this:

"Mr. Root, it does not matter to *me* how much you two quarrel, so long as you pay me ten cents a line for publishing what you have to say."

Of course, the editor was not a Christian. Well, after I had visited the ministers it occurred to me that my next job was to call on my rival and tell him of my new departure. I had gotten hold of the beautiful text, "Love your enemies, do good to them that hate you, and pray for them that despitefully use you." I told him that if he would forgive me for my past unbrotherly and unchristianlike conduct I would try to help him instead of hindering him in the future. He did not say much. Perhaps he thought he would wait awhile.

Just at that time each of us had invested in a silver-plated cake-basket. The price was about $10.00. A lady had been looking at both of the baskets. She finally came to me and said, "Mr. Root, I like the basket Mr. Wells has rather better than yours; but I want to be sure it is just as good silver plate. I believe you will be honest in the matter, and tell me if you think his is what he represents it to be." She added, "I know I have troubled you a great deal already, and I hope you will excuse me if I trade with him instead of you." I told her that, altho the baskets were made at different places, I believed that both were all right, and that she need not apologize for bothering me. I said it was a part of my business. She took the other basket, and I think she reported what she said; and for several days, and perhaps for weeks, I sent customers his way and felt happy in doing so. What do you think happened? He came to me one day and said something like this:

"Mr. Root, I do not understand this. I never heard of such a thing before, where a man would go out of his way to send trade to one who has been a rival in business. Now, if that is religion, I want some religion, too. God knows I need it."

I took him over to my pastor's study, where he knelt down with the pastor, and said in effect, "God have mercy on me a sinner," and from that time on we were friends; and it was my privilege to have a good talk with him just before he died a few years ago. I lost a little trade, to be sure, by my new departure; but, oh dear me! what comparison is there between a few dollars and cents more or less and the saving of a soul?

He which converteth the sinner from the error of his way shall save a soul from death, and shall hide a multitude of sins.—JAMES 5:20.

In another Home paper I will tell you something of the blessings that followed, and more about answers to prayers.

BRADENTOWN AND BRADENTOWN PEOPLE.

"Thy people shall be my people, and thy God my God."—RUTH 1:16.

"If ye have faith . . . ye shall say unto this mountain, Be thou removed, and . . . it shall be done."—MATT. 21:21.

"The wilderness and the solitary places shall be glad for them; and the desert shall rejoice and blossom as the rose.—ISA. 35:1.

Mrs. Root and I reached Bradentown, Fla., Oct. 21, and my attention was at once called to numbers of new buildings going up almost everywhere, not only residences on all the streets but great store buildings in the very heart of the town. Of course many of the residences, especially out of town, were but humble "homes," but there were quite a few that were to me gems of artistic beauty.

I especially admired the rock and cement work. On our own "Richland Avenue" there had been no new structures for some years, but now there are four, and one of them with its work of arches of native rock and cement, makes me want to stop and shout, every time I see it.

Well, the residences are not all. Right in the heart of the "city," where used to be a fine brick edifice, in fact right where Ernest and I used to get our nice dinners only a year ago, there are now only great heaps of sand, brick, crushed stone, etc. When I asked, in surprise, what had become of the fine structure, with its "plate glass windows," etc., the reply was:

"Moved to yonder place."

"What? Moved that great brick building?"

Sure enough, there it stood, without so much as a crack or blemish, so far as I could see. Do you wonder that I thought of my second text, about moving mountains, and it was faith that did it in both cases. And, my good friends, it was this same faith that has enabled our country to remove the demon of intemperance, and it is finally going to be pushed off, with war and its resulting famine, from the whole of the great wide world.

Bradentown is a busy place. No "great army of unemployed" about here. Not much. Shall I tell you how I know? Well, we have just had a "Tropical Hurricane" It did not blow over my windmills, but it blew the rubber belts off, blew off one wing or sail and "twisted both tails." But thanks to my big, stout "long-time friend," Kaiser, we were out of "juice" for only a few hours. Our home didn't fare so well. It gave the house such a shaking up that about a yard square of plaster came down from overhead in our best room. Of course I sent for a plasterer to repair the damage, but he had so many jobs I could never find him at home. The next man had promised all he could do until January. Everybody is busy, and from the way they all seem to be rushing things, it made me think of my last text, especially where I see them cleaning up and building new homes, away out in the pine woods and among the scrub palmettoes. I want to live and die among busy people. See first text.

We reached here Friday. By Saturday night I had planted peas, beans, radishes, turnips, spinach, curled cress, and last but by no means least, Hubam clover. If you want to know about this last read the bee journals and the great agricultural periodicals. It is the plant that is going to make the great world a "land flowing with (both) milk and honey." Well, the Hubam was up so you could see the rows in only two and three-fourths days. It has made a growth of seven or eight feet in less than four months here during our Florida winters and has been called by bee and cattle men a better feed than even alfalfa.

"Treasures in Heaven" as Well as on Earth.

I found the following on my table one morning when I came to work. After having read it I uttered a loud "amen." After you have read it do likewise, and then turn in and help.

Wellesley Hills, Mass., April 19, 1921.

As the great life insurance companies are spending huge sums on doctors, scientific investigations, and district nurses to improve the health of the nation, so we business men should spend huge sums to develop those fundamental religious qualities of integrity, industry, faith, and service, which make for true prosperity. I repeat, the need of the hour is—not more factories or materials, not more railroads or steamships, not more armies or navies—but rather more Christian education. This is not the time to reduce investments in schools and colleges at home, or in Y. M. C. A. and similar work in China, Japan, Russia, or South America. This is the time of all times to increase such subscriptions. Roger W. Babson.

Requeening, and Something About "Spotting Robbers."

I have been quite successful growing queens. I have requeened 50 colonies—two of which are at home, and so "ambitious" that I have got to carry them to an outyard. They watch me and stand ready to jump into any hive I open. This morning they went after a new nucleus which had only a few young bees. I opened up the hive, and they went on a rampage until I covered the hive with a blanket, when they soon quieted down. When I uncovered the hive, they were soon at it as bad as ever. I laid a frame of honey down, and had Mrs. Abbott sprinkle them with flour so I could see where they went. On watching the yard I could easily see that two colonies were doing all the mischief. In the morning I will carry them off and drop them like a "stray cat." D. W. Abbott.

Bradentown, Fla., Sept. 3, 1921.

In regard to spotting robbers and taking them away by sprinkling them with flour, my impression is that it is an old idea; but nevertheless it is a good one. It just now occurs to me that another kind of robbers of a recent date, especially in our great cities, when caught red-handed, make for a crowd; and when the policeman finally grabs him he declares he is not the man—a mistake has been made. Could we not manage in some ingenious way to sprinkle *these* chaps so we could tell better "who is who?"

My long-time friend, I am glad to hear of your success in raising queens; but if I understand you correctly you have requeened 50 colonies during the past summer. I am aware that much has been said about requeening all our colonies every season; and I think Ernest tells me that in California, some beekeepers keep their queens only about six months. I may be, in my old age, a little behind the times; but I do not think I would destroy any queen that seemed to be "making good" unless she were at least two or three years old. See clipping below:

It may be of interest to know that the queen purchased three years ago from you as "untested" proved the most valuable queen I have ever owned —proved to be a breeder of highest order, and is still on the job. This, her third summer, her colony made a good crop of honey for the year, and all my queens are being raised from graftings from her cells. Big two dollars' worth! We have dubbed her "Lady Root." A. J. Reamy, Jr.

Quitman, Ga., July 9, 1921.

HONEY MARKETS

(Continued from page 736.)

currency is about 7½ to 8 cents per lb for extracted honey. There has been very little doing in beeswax during the past month. The value per lb. at today's rate of exchange is about 24 cents. Taylor & Co.
Liverpool, England, Nov. 1.

CUBA.—Honey today is selling at 40c per gallon, and yellow beeswax at 20c per pound.
Matanzas, Cuba, Nov. 8. Adolfo Marzol.

Prices Received by Beekeepers as Reported to the Bureau of Markets

Nov. 1, 1921.

In a long tabulated report, giving prices received in every State, date of Nov. 1, the Bureau of Markets gives the average for the United States as follows:

Wholesale (and in large packages): White comb per section, 24.2c; dark comb per section, 20.6c. Extracted, per lb., white, 14.4c; extracted amber, 12.7c; extracted dark, 10.9c.

Retail: White comb per section, 28.4c; dark comb per section, 24c. Extracted, per lb., white, 20.8c; extracted amber, 18.2c; extracted dark, 15.5c.

The variation in the individual prices reported was large, ranging often as much as a third lower or higher than the average. As always, the beekeepers in the eastern United States reported receiving considerably more for both their comb and extracted honey, retail and wholesale, than did the western beekeepers.

From Producers' Associations.

We find inquiry for both comb and extracted honey steadily active, but buyers are unwilling to pay prices we are quoting. Comb honey is being placed in coast markets at extremely low figures by independent producers in near-by States. Extracted honey is being sold by independents in eastern Idaho and in near-by States at much lower prices than we have quoted to date. Both comb and extracted stock may be sold readily when we meet current market prices, and our members are now showing inclination to move what they hold.

We believe local honey should be sold now at what it will bring, or held until next spring.

Idaho-Oregon Honey Producers' Ass'n.
P. S. Farrell, Sec'y.

The price of honey remains unchanged, altho producers who yet have honey on hand expect to advance the price soon. The demand has increased steadily since the first of September and is now strong. The bulk of the honey is sold. The small amount remaining in the hands of the producers is not large enough to fill the demand. The prevailing price to the producer is 8-9c, extracted, 60 lbs. basis, and 12-14c bulk comb, same basis. Contrary to former years, the great demand this year was for 3's and 5's bulk comb. On account of honey crop failure in other States, Texas has placed much honey in territory new to her.

Texas Honey Producers' Ass'n.
San Antonio, Tex. E. G. LeStourgeon.

HONEY PRODUCTION OF 1921 WITH COMPARISONS.

States or Territories.	Usual per cent of U. S. crop.	Average yield per colony.			Kind of Honey						Disposal		
					Comb		Extracted		Bulk		To outside mkts.		
		1921	1920	1913-1919	1921	1914-1920	1921	1914-1920	1921	1914-1920	1921	1920	1915-1919
Maine	*-1	57	26	37	61	75	28	17	11	8	6	10	9
New Hampshire	*-1	38	39	37	72	87	25	12	3	1	8	4	15
Vermont	*-1	60	42	38	60	71	37	25	3	3	33	25	34
Massachusetts	*-1	46	46	31	45	59	51	37	4	4	9	2	8
Rhode Island	*-1	10	20	41	3	10	97	89	0	1	0	0	0
Connecticut	*-1	52	80	35	42	53	55	41	3	6	14	2	15
New York	5	75	70	53	38	48	61	51	1	1	42	38	42
New Jersey	*-1	55	55	37	35	36	62	63	3	1	15	20	21
Pennsylvania	4	45	57	42	59	56	38	39	3	5	16	25	22
Delaware	*-1	..	20	29	..	47	..	29	..	26	..	0	15
Maryland	*-1	28	45	39	49	63	35	30	16	7	35	21	22
Virginia	3	18	45	40	52	65	33	17	15	18	12	13	15
West Virginia	1	29	37	28	48	52	13	15	39	34	12	7	9
North Carolina	3	10	55	30	35	34	29	20	36	48	10	5	10
South Carolina	1	17	28	26	55	46	10	24	35	30	7	7	17
Georgia	3	35	22	38	23	25	49	42	28	32	28	25	24
Florida	2	44	37	66	17	14	82	85	1	1	50	35	52
Ohio	3	85	64	38	54	59	45	39	1	2	30	20	22
Indiana	3	60	55	42	43	53	45	36	12	10	9	6	5
Illinois	5	46	42	46	28	40	67	57	5	3	20	16	26
Michigan	4	95	69	48	38	42	61	58	1	1	7	27	35
Wisconsin	4	42	85	52	25	36	75	63	0	1	29	18	32
Minnesota	3	62	78	50	23	35	74	64	3	1	18	18	26
Iowa	5	50	75	58	43	49	55	49	2	3	19	20	22
Missouri	3	37	67	34	30	34	50	43	20	22	5	9	10
North Dakota	*-1	150	..	67	36	50	64	50	0	0	0	..	0
South Dakota	1	85	97	62	48	49	46	44	6	8	12	39	11
Nebraska	1	55	71	51	55	52	39	42	6	6	18	16	17
Kansas	2	32	43	33	57	59	36	31	7	11	15	20	9
Kentucky	4	45	30	42	23	34	49	49	28	17	30	29	41
Tennessee	3	28	17	29	24	30	42	35	34	35	6	6	12
Alabama	3	29	22	37	..	25	..	48	..	23	36	5	36
Mississippi	2	39	25	35	45	45	30	27	25	28	20	12	23
Louisiana	1	55	61	37	19	14	59	46	22	40	35	54	43
Texas	5	45	70	37	6	7	63	61	31	32	50	46	52
Oklahoma	1	27	43	31	24	32	45	28	31	40	2	2	5
Arkansas	1	37	25	25	35	36	29	23	36	41	15	13	11
Montana	1	88	86	81	41	58	52	38	7	3	40	37	34
Wyoming	1	100	85	77	38	66	57	33	5	1	65	..	58
Colorado	3	58	52	55	57	56	43	42	0	2	65	76	64
New Mexico	1	50	55	47	59	42	35	47	6	10	50	85	56
Arizona	1	42	92	61	4	7	96	91	0	2	75	39	64
Utah	1	70	108	70	10	10	90	89	0	1	55	43	57
Nevada	1	25	83	65	..	36	..	64	..	0	..	68	79
Idaho	2	80	97	71	15	34	85	64	0	1	66	64	66
Washington	2	50	60	52	24	31	69	67	7	1	37	36	45
Oregon	1	60	65	46	..	53	..	43	..	4	40	36	36
California	10	23	93	61	5	12	95	87	0	2	57	71	86
United States	100	44.2	59.1	43.3	30.4	35.6	55.7	50.2	13.9	14.2	20.1	28.4	34.3

* -Less than one per cent.

Classified Advertisements

Notices will be inserted in these classified columns for 50c per line. Advertisements intended for this department cannot be less than two lines, and you must say you want your advertisement in the classified column or we will not be responsible for errors. Copy should be received by 15th of preceding month to insure insertion.

REGULAR ADVERTISEMENTS DISCONTINUED IN GOOD STANDING.

(Temporary advertisers and advertisers of small lots, when discontinued, are not here listed. It is only regular advertisers of regular lines who are here listed when their advertisements are discontinued when they are in good standing.)

Carl F. Buck, P. W. Sowinski, A. C. Ames, C. H. Hodgkin, Martin Carsmoe, D. L. Woodward, D. R. Townsend, Gelser Bros., Geo. M. Sowarby, E. J. Stahlman, Edgar Williams, J. D. Beals, Adam Bodenschatz, J. H. Corwin, Geo. W. Coltrin & Son, J. B. Hollopeter, Mrs. S. A. Bradshaw, F. M. Schader, A. H. Newman, Bobbs-Merrill Co., Rosedale Apiaries, DeGraff Food Co.

HONEY AND WAX FOR SALE

FOR SALE—Dark clover honey from the capping melter. J. F. Moore, Tiffin, Ohio.

FOR SALE—Buckwheat honey in 60-lb. cans. Bert Smith, Romulus, N. Y.

FOR SALE—Buckwheat honey in 5-lb., 10-lb., or 60-lb. cans. H. B. Gable, Romulus, N. Y.

FOR SALE—Finest quality alsike, alfalfa, sweet clover honey in 60-lb. cans. R. Selwyn Wilson, Buhl, Idaho.

FOR SALE—N. Y. State light amber honey, two 60-lb. cans in case, 10c a lb. I. J. Stringham, Glen Cove, N. Y.

FOR SALE—A ton of extracted honey suitable for baking purposes. E. D. Townsend & Sons, Northstar, Michigan.

FOR SALE—Clover, amber, and buckwheat honey. 60-lb. cans and 5 and 10-lb. pails. C. J. Baldridge, Kendaia, N. Y.

FOR SALE—Finest quality clover-basswood and buckwheat honey, 5, 10, and 60 lb. tins. H. F. Williams, Romulus, N. Y.

FOR SALE—Choice clover honey in new 60-lb. cans, all produced on new combs. Sample 20c. W. B. Crane, McComb, Ohio.

FOR SALE—Buckwheat honey in 60-lb. cans, one can to case, liquefied, $6.00. Two cans to case, granulated, $10.80. John J. Lewis, Lyons, N. Y.

FOR SALE—Choice clover honey, 15c; buckwheat, 10c per pound. Two 60-lb. cans to case, f. o. b. here. Wm. Vollmer, Akron, N. Y.

FOR SALE—Choice white clover honey in 60-lb. cans, two cans in a case, at 13c per lb. Sample 10c. Leonard S. Griggs, 711 Avon St., Flint, Mich.

FOR SALE—12,000 lbs. of choice white clover honey in 60-lb. cans at 15c per lb., f. o. b. Brooksville, Ky. Sample 25c. W. B. Wallin, Brooksville, Ky.

FOR SALE—Clover, basswood, or buckwheat honey, comb and extracted, by the case, ton, or carload. Let me supply your wants with this fine N. Y. State honey. C. B. Howard, Geneva, N. Y.

FOR SALE—White and amber honey in 5-lb. pails, packed in cases of 12. R. C. Wittman, St. Marys, Pa.

CLA-FO-NY-QUALITY buckwheat honey (liquid or crystallized), 5-lb. pails, 65c each, 15 to case. Clarence Foote, Delanson, N. Y.

FOR SALE—Extra fancy clover honey well ripened and put up in new cans, 60 lbs. net; per case of two cans, $15.50. Edw. A. Winkler, R. F. D. No. 1, Joliet, Ill.

FOR SALE—White honey in 60-lb. cans, also West Indian in 50-gal. barrels. Sample and price on request. A. I. Root Co., 23 Leonard St., New York City.

FOR SALE—Fine quality light amber honey, over half clover. Put up in 5-lb. pails, packed in barrels. Heated to prevent granulation. Price right. The Scott Apiaries, LaGrange, Ind.

FOR SALE—Several thousand pounds of the finest quality clover extracted honey. New cans and cases. None better produced. Howard Townsend, Northstar, Michigan.

FOR SALE—Extra choice extracted white clover honey, put up in new 60-lb. cans and 5-lb. pails. Sample 20c, same to apply on first order. David Running, Filion, Mich.

FOR SALE—White honey, 15c a lb.; L. A. alfalfa, 14c, in two 60-lb. cans; Chilian in 165-lb. kegs, 10c; light amber honey in 50-gal. bbls., 80c a gal. Beeswax, 30c a lb. Walter C. Morris, 105 Hudson St., New York City.

HONEY FOR SALE—In 60-lb. tins, water-white orange, 14c; water-white clover or white sage, 13c; extra L. A. sage, 11c; N. Y. State buckwheat, 10c, for immediate shipment from New York. Hoffman & Hauck, Inc., Woodhaven, N. Y.

YOU have to buy only 600 pounds of E. D. Townsend & Sons' fine clover extracted honey to get their very lowest wholesale price this year. If your customers require the best, write them at Northstar, Michigan, for their price.

FOR SALE—4000 lbs. medium amber extracted honey, left on the hives until thoroly ripened. Put up in 60-lb. cans, two to the case, at $12.00 per case, f. o. b. at Marietta. J. G. Burtis, Marietta, N. Y.

FOR SALE—7000 lbs. fine quality white sweet clover honey, put up in good clean second-hand cans. It is well ripened and rich, and the price as long as it lasts is 12c per lb. in 60-lb. cans, two cans to the case. Try it. Joe C. Weaver, Cochrane, Ala.

FOR SALE—No. 1 white comb honey, $6.00 per case; No. 2 white comb, $5.00 per case of 24 sections; six cases to carrier. Clover extracted, two 60-lb. cans to case, 15c a lb.; clover in 5-lb. pails, $1.00 each, 12 pails to case. Amber baking honey in 60-lb. cans, 10c; same in 50-gal. barrels, 8c. H. G. Quirin, Bellevue, Ohio.

FOR SALE—Extra fine Michigan white clover and basswood honey. Almost water white. Indeed, I doubt if the color, body, and flavor can be beat. Put up in 60-lb. cans, two to the case, at 15c per pound, or in 5-lb. pails, 50 to the barrel, at 17c per pound. Sample 15c. O. H. Schmidt, R. D. No. 5, Bay City, Mich.

RASPBERRY HONEY—Blended with a slight amount of willow-herb honey, two of the best honeys of northern Michigan. It was all thoroly ripened by the bees. It is good thick body, and fine flavor, none better for table use. It is put up for sale in 60-lb. tin cans. Price for two cans in a case, $18.00; for one can in a case, $9.50. Sample by mail, 20c, which may be applied on purchase of honey. Elmer Hutchinson & Son, Lake City, Mich.

FOR SALE—A carload of the very finest quality extracted honey. This crop of honey was produced above excluders, in white combs that have never been used for brood; then the entire crop was left upon the hives until some time after the close of the honey flow, so is very thoroly cured by the bees. It is being put into new 60-lb. net tin cans; in fact, not a single thing has been neglected to make this crop of honey the finest possible to produce. It was gathered from white clover principally, with a very little basswood mixed in it, perhaps 5%. Of course, this fine honey is worth more than ordinary honey and we have to ask just a little above market price for it, so those not having a market that will pay a little more for an extra quality honey, had better not write about this year's crop of honey. E. D. Townsend & Sons, Northstar, Michigan.

HONEY AND WAX WANTED.

WANTED—Bulk comb and section honey. J. E. Harris, Morristown, Tenn.

WANTED—Honey, section, bulk comb, and extracted. W. A. Hunter, Terre Haute, Ind.

HONEY WANTED—Give particulars in first letter. Elton Warner, "Beaverdam," Asheville, N. C.

BEESWAX WANTED—For manufacture into SUPERIOR FOUNDATION. (Weed Process.) Superior Honey Co., Ogden, Utah.

I AM in the market for white clover, basswood, or amber honey. Send sample and quote me your lowest prices delivered f. o. b. Preston. M. V. Facey, Preston, Minn.

WANTED—All kinds comb and extracted honey and beeswax. Car lots or less—and full colonies of bees. W. C. Morris, 170 Rossiter Ave., Yonkers, N. Y.

WANTED—Shipments of old combs and cappings for rendering. We pay the highest cash and trade prices, charging but 5c a pound for wax rendered. The Fred W. Muth Co., Pearl and Walnut Sts., Cincinnati, O.

WANTED—Beeswax. We are paying 1 and 2c extra for choice yellow beeswax and in exchange for supplies we can offer a still better price. Be sure your shipment bears your name and address, so we can identify it immediately upon arrival, and make prompt remittance. The A. I. Root Co., Medina, Ohio.

WE BUY honey and beeswax. Give us your best price delivered in New York. On comb honey, state quantity, quality, size, and weight of sections and number of sections to a case. Extracted honey, quantity, quality, how packed, and send samples. Chas. Israel Bros. Co., 486-490 Canal St., New York City.

FOR SALE.

ROOT'S GOODS AT ROOT'S PRICES. A. W. Yates, Hartford, Conn.

HONEY LABELS—New designs. Catalog free. Eastern Label Co., Clintonville, Conn.

FOR SALE—A full line of Root's goods at Root's prices. A. L. Healy, Mayaguez, Porto Rico.

YOU will make no mistake in ordering your comb foundation of E. S. Robinson, Mayville, N. Y.

FOR SALE—1500 sections, 500 M fences, 500 section-holders, springs, all 4x5x1⅜. Thos. Wiley, Brewster, Minn.

FOR SALE—Good second-hand 60-lb. cans, two cans to a case, boxed, at 60c per case f. o. b. Cincinnati. Terms cash. C. H. W. Weber & Co., 2163 Central Ave., Cincinnati, Ohio.

PORTER BEE-ESCAPES save honey, time, and money. Great labor-savers. For sale by all dealers in bee supplies. R. & E. C. Porter, Lewiston, Ill.

FOR SALE — "SUPERIOR" FOUNDATION, "quality unexcelled." Let us prove it. Order now. Superior Honey Co., Ogden, Utah.

FOR SALE—28 unbound zinc queen-excluders or honey-boards, 8-frame size. New, never used. 30c each. J. B. Sanderson, Fredericksburg, Ohio.

ROOT'S BEE SUPPLIES—For the Central Southwest beekeepers. Beeswax wanted. Free catalog. Stiles Bee Supply Co., Stillwater, Okla.

SHIPPING CASES—1000 12-lb. three-row shipping cases, 2-inch glass for 4¼x4¼x1½-inch plain sections. These cases are complete, KD, packed in crates of 50. Price per crate, $12.50. The A. I. Root Co., Medina, Ohio.

BOOKS recommended by A. I. Root: Tile Drainage, 25c; A B C of Potato Culture, cloth, 75c, paper, 50c; Merrybanks and His Neighbors, 15c; Winter Care of Horses and Cattle, 25c; Tomato Culture, 25c. The A. I. Root Co., Medina, Ohio.

WANTS AND EXCHANGES.

ROYAL typewriter, $65.00. Will trade for honey, queens or offer. E. A. Harris, Albany, Ala.

WANTED—Four-frame reversible power extractor. State price. Address B. R. Russell, Gardnerville, Nev.

WANTED BEES, 100 to 150 colonies with or without outfit. Glen Holtermann, Waterford, R. D. No. 4, Ont., Can.

WANTED—Old combs and cappings for rendering on shares. Our steam equipment secures all the wax. Superior Honey Co., Ogden, Utah.

WANTED—From 300 to 1500 colonies in good location in north or west to run on shares. References as to ability and honesty. The Stover Apiaries, Mayhew, Miss.

BEESWAX wanted. Old combs (dry) and cappings for rendering. Also wax accepted in trade. Top market prices offered. A. I. Root Co. of Iowa, Council Bluffs, Iowa.

OLD COMBS, cappings, or slumgum wanted for rendering by steam press process. We pay cash for wax rendered, trade for supplies, or work it into foundation. W. T. Falconer Mfg. Co., Falconer, N. Y.

WANTED TO BUY—Complete metal roller outfit for making comb foundation for personal use in apiary 500 colonies strong. State brand, condition, and lowest price. David C. Chapa, Apartado 10198, Mexico City, D. F.

WANTED—10-frame standard hives and equipment, empty combs (wired) and bees (nearby). To interest must be warranted disease-free, good condition and priced right. L. W. Smith, Madison, N. J. (or 56 William St., New York City).

OLD COMBS WANTED—Our steam wax-presses will get every ounce of beeswax out of old combs, cappings, or slumgum. Send for our terms and our 1921 catalog. We will buy your share of the wax for cash or will work it into foundation for you. Dadant & Son, Hamilton, Illinois.

REAL ESTATE

FOR SALE—30 acres of land near Arcadia, Fla., bungalow house with two large porches, 40 colonies of bees, more or less. 250 colonies of bees in six apiaries along the Caloosahatchee River. Fine locations for honey, to ship bees or rear queens. No disease. Ward Lamkin, Arcadia, Fla.

SEEDS AND PLANTS.

"We will not guarantee the purity of any seed advertised nor any nursery stock, as nurserymen ordinarily will not do this themselves; but any seedsman or nurseryman advertising in our columns will have given us excellent references in advance, and our readers may consider this fact in their favor."—From Our Guarantee and Advertising Conditions.

HUBAM clover seed for sale. Get my prices. J. Tom White, Dublin, Ga.

PURE Hubam or white annual sweet clover seed. Oz., 25c; lb., $2.00. L. B. Harber, Rt. 1, Mt. Olivet, Ky.

HUBAM or annual sweet clover seed (Hughes variety), at reduced prices. Evan Jones, Williamstown, N. J.

FOR SALE—Hubam clover, genuine Hughes strain (scarified). Jas. H. Kitchen, Springfield, R. D. No. 5, Ohio.

HUBAM, or white annual sweet clover. Grow it for your bees, and get a seed crop, while the seed is scarce. Booking orders for fall delivery. E. G. Lewis Co., Media, Ills.

HUBAM—The annual white sweet clover, produced under garden cultivation. Guaranteed genuine Hubam seed, cleaned, hulled, and scarified. $2.00 per pound, prepaid. Blair Bros., R. D. No. 4. Ames, Iowa.

FOR SALE—A limited quantity of my crop of Giant Annual white sweet clover seed of the Hughes variety. This seed was all produced under cultivation. References and prices furnished upon application. All seed genuine, certified, and scarified with an Ames scarifier. Get your supply before I am all sold out. Edw. A. Winkler, R. F. D. No. 1, Joliet, Ill.

BEES AND QUEENS.

WATCH for my advertisement in January '22 issue. Allen Latham, Norwichtown, Conn.

FOR SALE—Italian queens, nuclei, and packages. B. F. Kindig, E. Lansing, Mich.

HARDY Italian queens, $1.00 each. W. G. Lauver, Middletown, Pa.

SEE our large advertisement on page 786 for prices. Buckeye Bee Co., Justus, Ohio.

WHEN it's GOLDEN, it's PHELPS. C. W. Phelps & Son, Binghamton, N. Y.

TRY ACHORD'S BEES and QUEENS. Price list by return mail. W. D. Achord, Fitzpatrick, Ala.

IT WILL pay you to write for my 1922 circular and price list before placing order for those bees. R. V. Stearns, Brady, Texas.

1922 PACKAGE bees and queens, untested and day-old, in Thompson safety cages. Send for circular. James McKee, Riverside, Calif.

FOR SALE—Carload bees, nuclei, pound packages, full colonies. See our ad elsewhere. The Stover Apiaries, Mayhew, Miss.

FOR SALE—At pre-war prices, very best Italian queens and bees. Give us a trial. 700 colonies to fill your orders with. Rosedale Apiaries, J. B. Marshall and H. P. LeBlanc, Props., Big Bend. La.

QUEENS, package bees, and nuclei. Booking orders now for 1922. Shipping begins March 15. Our early queens ready for northern queenless colonies at unpacking time. One untested, $1.50; one select untested, $1.70. Circular free of our pedigreed strain on request. Dr. White Bee Company, Sandia, Texas.

FOR SALE—13 good painted hives of bees, with supers. For quick sale, $5.00. A. McClinton, Trenton, Ga.

PHELPS GOLDEN QUEENS will please you. Mated, $2.00; 6, $10.00; or $18.00 a doz. C. W. Phelps & Son, Binghamton, N. Y.

FOR SALE—1½-story hives with bees, $4.00 each, 1½-story empty, $2.25 each. All perfect condition. No disease. G. C. Sykes, West, Miss.

BEES AND QUEENS from my Carolina apiaries —progeny of my famous Porto Rican pedigreed breeding stock. Elton Warner, Asheville, N. C.

QUEENS OF QUALITY for 1922. Three-banded Italians only. After April 15, untested, $1.25; tested, $2.00. Satisfaction guaranteed. P. M. Williams, Ft. Deposit, Ala.

FOR SALE—500 colonies in 4 yards, with power extractor, easy terms, near English colony. Very healthful, wonderful flows, local market. M. C. Engle, Herradura, Cuba.

WE are now booking orders for spring delivery of our queens and package bees. Write us your wants and ask for prices. Graydon Bros., Greenville, R. D. No. 4, Alabama.

BEES BY THE POUND — Also QUEENS. Booking orders now. FREE circulars giving details. See larger ad elsewhere. Nueces County Apiaries, Calallen, Texas, E. B. Ault, Prop.

THREE-BAND packages bees, queens, and nuclei, April and May delivery. Special orders solicited. Write for prices and terms. Safe arrival and satisfaction guaranteed. Tupelo Honey Co., Columbia, Ala.

AM now booking orders for three-frame nuclei and queens of Dr. Miller's strain for 1922 delivery. I wish to thank my many satisfied customers for their patronage. S. G. Crocker, Jr., Roland Park, Baltimore, Md.

IF GOOD bright Italian queens are wanted by return mail, send your order to M. Bates, Greenville, Ala. Price, $1.00 each; $10.00 per dozen; $75 per 100. Pure mating, safe arrival, and satisfaction guaranteed.

FOR SALE—Three-banded Italian bees and queens. 2-lb. package with queen, $4.75; without queen, $3.75. Queens, $1.00 each, $11.00 per dozen; 25 per cent cash books order; safe arrival and satisfaction guaranteed in U. S. and Canada. We ship nothing but the best. W. C. Smith & Co., Calhoun, Ala.

EARLY SPRING delivery, 1922. Three-banded stock only. One Hoffman frame emerging brood, one good untested queen, one pound bees, April delivery, $5.25 each package. Same as above, May delivery, $4.75. 5 per cent discount on 25 packages or more; 10 per cent deposit to book your order. L. C. Mayeux, Hamburg, La.

CALIFORNIA ITALIAN QUEENS, the old reliable three-banded stock that delivers the goods. Every queen actually LAYING before being caged, and fully guaranteed. I also guarantee safe arrival. SPECIAL FALL PRICES, select untested, 1, $1.25; 6, $7.00; 12, $13.00; 25 to 99, $1.00 each; 100 and over, 90c each. Package bees for next spring delivery. Circular free. California Apiaries, J. E. Wing, Prop., 155 Schiele Ave., San Jose, Calif.

BEES AND QUEENS—Vigorous Italian queens, famous leather-colored, three-banded stock, and also bees in packages. Two-pound package, with queen, 6.00; three-pound package, with queen, $7.25; terms, deposit of 25% with order, balance just prior to shipment. These prices f. o. b. St. Rose, La. My bees are healthy. Unsolicited testimonials vouch for satisfaction given. Shipments begin about May 1, depending upon weather and season conditions. Safe arrival, or replacement or money refunded. C. M. Elfer, St. Rose, La.

"SELECTED QUEENS of Quality for 1922." Book your orders now for our golden and three-banded Italians. Reared by experienced breeder; bred for combined qualities; large, vigorous, well marked, priced right. Untested, $1.20 each; 6, $6.50; 12, $12.00. 25% places your order. You want good queens. We want your business. G. H. Merrill, Greenville, R. D. No. 5, S. C.

PHELPS' GOLDEN ITALIAN QUEENS combine the qualities you want. They are GREAT HONEY-GATHERERS, BEAUTIFUL, and GENTLE. Virgins, $1.00; mated, $2.00; 6 for $10.00, or $18.00 per doz.; tested, $5.00. Breeders, $10.00 to $20. Safe arrival guaranteed only in the U. S. and Canada. C. W. Phelps & Son, Binghamton, N. Y.

FOR SALE—Package bees for spring delivery, three-band strain, bred for business, 20% cash books your order. Safe arrival and satisfaction guaranteed. A two-pound package of bees and select untested queen for $5.00; 25 or more for $4.75 each. Write for prices on larger lots. Caney Valley Apiaries, J. D. Yancey, Mgr., Bay City, Texas.

I EXPECT to be ready to start shipping 3-lb. packages of bees with 1-frame brood and bees. 1 untested queen, at $6.00; 2-frame with untested queen, $4.50, about April 15. Young tested queen, 50c extra, or $1.50 each. I think I was the second to ship packages of bees from this State and know how to serve customers. F. M. Morgan, Hamburg, La.

FOR SPRING DELIVERY, 1922—One vigorous Italian queen, one frame emerging brood, one pound bees. Price, complete, f. o. b. Bordelonville. $5.00. Additional frames of brood, each $1.00; additional pounds of bees, each $1.00. Queen introduced and laying en route to you. Safe delivery and satisfaction guaranteed. No disease. Reference given. Orders booked one-fifth down. May delivery. Send for addresses of satisfied customers. Jes Dalton, Bordelonville, La.

FOR MAY AND JUNE DELIVERY—Place your order for our high-grade three-banded Italian bees and queens now. Take advantage of early order discounts by ordering now. We guarantee to please you. Prompt service and quality stock is our motto. We want your orders for bees on Root standard Hoffman frames, emerging bees. Pound packages and nuclei, with or without queens. Write for our prices and valuable information. Oscar Mayeux, Hamburg, La .

PACKAGE BEES, delivery April 15 to May 15, 1922. Three-banded Italians, no disease, safe arrival and satisfaction guaranteed. Inspection certificate with each package. 2-lb. pkg. bees with select untested queen, $6.50; 3-lb. pkg. bees with select untested queen, $8.50. 10% discount on orders of 25 or more packages; 25% books your order. References A. I. Root Co., New Orleans, La. R. S. Knight, 4927 Conti St., New Orleans, La.

NEW 1922 PRICES—On account of the present price of honey and recent reduction in the price of supplies we are now booking orders for our three-band leather-colored Italians at the following low prices: 2-lb. packages of bees, no queen, $4.00; untested queen, $1.25; 12, $13.50. Select untested, $1.50; 12, $15.00; tested, $2.25; 12, $20.00. No disease. Safe arrival in U. S. and Canada and satisfaction guaranteed. Write for circular and prices on quantities. J. M. Cutts, R. D. No. 1, Montgomery, Ala.

FOR SALE—1922 bees. Mr. Beeman, send your order early. First arrived, first served. Make shipment April 25 to June 5. Several years' experience. 2-lb. package three-banded Italian bees, 1 untested queen, $5.50. 1st. We use pure sugar syrup; better than honey or candy to ship on; it contains water as well as feed. 2nd. Feeders are made more substantial, ⅓ larger and have screw cap that will not jar out. One-third down and balance just before shipment. Guarantee safe arrival all over U. S. and Canada. A. J. Lemoine, Moreauville, La.

WE are now equipped to handle your early spring orders for package bees, and Italian queens, especially bred for the production of honey. Prices will be in accord with the reduction in material and labor. Safe arrival guaranteed. Write for prices and terms. Sarasota Bee Co., Sarasota, Fla.

BOOKING orders for spring delivery. Queens, package bees, and nuclei. The reliable A. I. Root strain. Golden and leather-colored Italians. Virgins, 60c; untested, $1.50; select untested, $2.00; tested, $2.50; select tested, $3.00. Circular free. A. J. Pinard, 440 N. 6th St., San Jose, Calif.

FOR SALE—Pure Italian bees for 1922 spring delivery. Pound packages shipped with stores on Hoffman standard frames. Certificate of inspection with each shipment. Safe arrival and satisfaction guaranteed. 2 lbs. bees, $4.75; 3 lbs. bees, $6.25; 1-fr. nucleus, $3.75; 2-fr. nucleus, $5.75; add price of queen desired with each package. Untested queens, $1.00 each after May 1. Tested queens reared during fall 1921 especially for early shipment at $2.00 each, beginning April 15. 25% books your order. Discount on large orders. J. L. St. Romain, White Clover Farm & Apiary, Hamburg, La .

NOTICE, Mr. Beekeeper:—We are prepared to handle your orders for spring delivery, 1922, for pound packages, nuclei and full colonies of high-grade three-banded leather-colored and golden Italian bees and queens. They are great honey-gatherers, hardy, gentle and resistant to bee diseases, bred from the best strains of queens obtainable. Untested, tested, select tested, just as you wish. I also have an outyard of hybrid bees to sell with Italian queens in pound packages. Very reasonable. Safe delivery guaranteed, prompt service, satisfaction. Write for prices and recommendations from satisfied customers. Pre-war prices. No disease. M. Voinche, Bunkie, La.

MISCELLANEOUS.

MEDICINAL roots and herbs are very profitable to grow. We especially recommend growing Golden Seal, which with good care will yield as high as $10,000 per acre for each crop. It takes several years to mature but will average $1000 a year. Special Crops, a monthly paper, tells how. Sample copy, 10c; $1.00 per year. Address Special Crops Pub. Co., Box "G," Skaneateles, N. Y.

HELP WANTED

WANTED—Practical beeman. Shares. Address with full particulars. F. McCann, La Gloria, Cuba.

WANTED—One experienced queen-breeder for season of 1922. Give age, experience, and reference in first letter, also wages desired. N. Forehand, Ramer, Ala.

SITUATIONS WANTED

YOUNG man 19 wants to learn beekeeping. Three years' experience in small apiary. Habits good, not afraid of work, ambitious. Wages not considered. W. A. Scheibe, 51 6th Ave., New York City.

The "BEST" LIGHT
Positively the cheapest and strongest light on earth. Used in every country on the globe. Makes and burns its own gas. Casts no shadows. Clean and odorless. Absolutely safe. Over 200 styles. 100 to 2000 Candle Power. Fully Guaranteed Write for catalog. AGENTS WANTED EVERYWHERE.

THE BEST LIGHT CO.
306 E. 5th St., Canton, O.

INDIANOLA APIARY

is now booking orders for 1922 for Italian bees and queens. Write for price list and circular. No disease. Bees inspected by State inspector.

J. W. SHERMAN
Valdosta, Ga.

Bees & Queens for 1922

10 Per Cent Discount for Orders Received Before 1922

One 1-frame nucleus with untested queen, $4.00; one 2-frame nucleus with untested queen, $5.00; untested queens, $1.25 each; 12, $1.10 each; tested queens, $1.60 each; 12 or more, $1.35 each; select tested queens, $2.00 each. Breeders, $5.00 at all times.

H. L. MURRY, SOSO, MISS.

World's Best Roofing at Factory Prices

"Reo" Cluster Metal Shingles, V-Crimp, Corrugated, Standing Seam, Painted or Galvanized Roofings, Sidings, Wallboard, Paints, etc., direct to you at Rock-Bottom Factory Prices. Positively greatest offer ever made.

Edwards "Reo" Metal Shingles

cost less; outlast three ordinary roofs. No painting or repairs. Guaranteed rot-fire, rust, lightning proof.

Free Roofing Book

Get our wonderfully low prices and free samples. We sell direct to you and save you all in-between dealer's profits. Ask for Book No. 183

LOW PRICED GARAGES

Lowest prices on Ready-Made Fire-Proof Steel Garages. Set up any place. Send postal for Garage Book, showing styles.

THE EDWARDS MFG. CO.,
1233-1283 Pike St., Cincinnati, O.

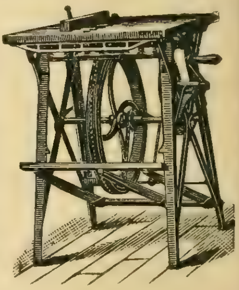
FREE Samples & Roofing Book

LARGE, HARDY, PROLIFIC QUEENS

Three-band Italians and Goldens. Pure mating and safe arrival guaranteed. We ship only queens that are top notchers in size, prolificness, and color. After June 1st: Untested queens, $1.50 each; 6 for $8.00; 12 or more, $1.40 each; 25 or more, $1.25 each. Tested queens, $3.00 each; six for $16.00.

Buckeye Bee Co., Justus, Ohio.

BARNES' Hand and Foot Power Machinery



This cut represents our combined circular saw, which is made for beekeepers' use in the construction of their hives, sections, etc.

Machines on Trial

Send for illustrated catalog and prices.

W. F. & JOHN BARNES CO
545 Ruby Street
ROCKFORD. ILLINOIS

NORTHERN-GROWN HUBAM SEED

BEEKEEPERS:—Now is the time for all beekeepers to secure the new Hubam annual sweet clover seed for planting on waste land next spring, and to interest and educate their neighbors in planting it. It will pay any beekeeper to give away seed and to instruct neighbors how to grow it, in order to secure bee pasturage from one of the greatest honey-yielders known. DEALERS:—This is just the time to get prices and to interest prospects for spring. Get the county agents back of this valuable new clover, and arrange with us to get your seed at once.

Hubam seed will be sold by all branch offices of the A. I. Root Company, and by many of our authorized distributers.

THE A. I. ROOT COMPANY
MEDINA, OHIO

BANKING BY MAIL AT 4%

DISTANCE NO BARRIER.

It matters not in the least where you live, you can avail yourself of the safety and convenience afforded by this bank as though you lived in Medina. Write for our "Banking by Mail" booklet.

THE SAVINGS DEPOSIT BANK CO.

A. T. SPITZER, Pres.
E. R. ROOT, Vice Pres. E. B. SPITZER, Cash.
MEDINA, OHIO

MASON BEE SUPPLY COMPANY
MECHANIC FALLS, MAINE

From 1897 to 1921 the Northeastern Branch of The A. I. Root Company.

PROMPT AND EFFICIENT SERVICE
BECAUSE—Only Root's Goods are sold.
It is a business with us—not a side line.
Eight mails daily—Two lines of railway.
If you have not received 1921 catalog send name at once.

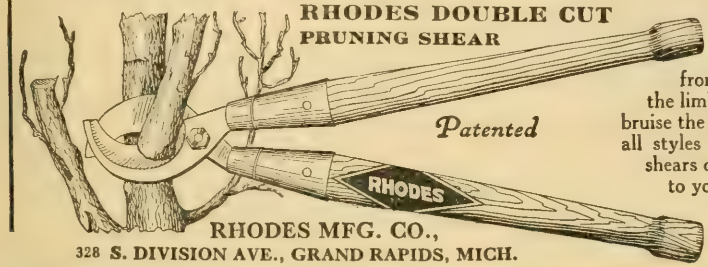
CANDY FOR WINTER FEED

In winter bees sometimes starve with plenty of honey in the hive. Use candy and avoid this unnecessary loss. Put up in large paper plates weighing two pounds each. Write for price, also catalog of Bee Supplies.

H. H. JEPSON

182 Friend St. Boston, 14, Mass.

RHODES DOUBLE CUT
PRUNING SHEAR



THE only pruner made that cuts from both sides of the limb and does not bruise the bark. Made in all styles and sizes. All shears delivered free to your door. Write for circular and prices.

RHODES MFG. CO.,
328 S. DIVISION AVE., GRAND RAPIDS, MICH.

FOR YOUR 1921 CROP

Comb honey shipping cases, honey cans, friction-top pails. Price on application.

Early order cash discount on sections, hives, supers, frames, comb foundation, and other goods.

Buy now and get supplies ready for 1922. Make out your list, and send for our prices.

AUGUST LOTZ COMPANY, BOYD, WIS.

Write for our Red Catalog with reduced price sheet.

Reductions are from 10% to 35% off our Spring and Summer prices.

LET US MAKE YOUR BEESWAX INTO FOUNDATION NOW, SO YOU WILL HAVE IT READY EARLY IN THE SPRING.
We also render wax from old combs and slum gum.

Send Us a List of Your Requirements in
BEE SUPPLIES

We sell the best possible goods at the lowest possible prices.

W. T. FALCONER MFG. COMPANY
FALCONER (Near Jamestown), N. Y., U. S. A.

''Where the best beehives come from.''

RAW FURS

Graders' Guide and Price List Free

READY NOVEMBER 20

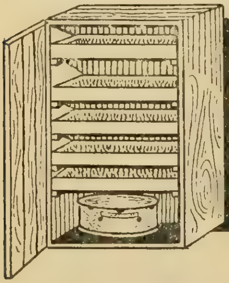
GEO. E. KRAMER, Valencia, Pa.

PATENTS Practice in Patent Office and Court. Patent Counsel of The A. I. Root Co.

Chas. J. Williamson, McLachlan Building,
WASHINGTON, D. C,

"Best" Hand Lantern

A powerful portable lamp, giving a 300 candle power pure white light. Just what the farmer, dairyman, stockman, etc. needs. Safe—Reliable—Economical—Absolutely Rain, Storm and Bug proof. Burns either gasoline or kerosene. Light in weight. **Agents wanted. Big Profits. Write for Catalog.** THE BEST LIGHT CO.
306 E. 5th St., Canton, O.



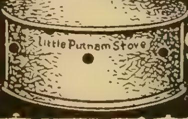
Oat Sprouter $2.49

You can make a better sprouter than you can buy. This sprouter was made in one evening by a 14 year old boy with a saw and hammer. The cost, with heater, was $2.49. Thousands in use. All say it is the best and handiest made.

Make Layers Out of Loafers.

To make hens lay their best, in winter, *growing* green food, rich in vitamines, must be fed. Sprouted oats are best. The Putnam Home Made Sprouter yields the best and sweetest sprouts and with the least work. I will send, free, plans for this sprouter with description of Little Putnam Stove to heat it. Also instructions for use of stove to keep fowls' drinking water unfrozen. Stove holds three pints of oil. Burns a month without trimming or filling. Patented burner. Nothing like it. Ask your dealer, or send me his name and $2.00 and get one by return mail, postpaid. Try it. If not satisfied, return in 10 days and I'll refund $2.00 and postage. I run all risks.

I. PUTNAM, Route 1260-0 Elmira, N. Y.



$2.00 Post Paid

"The Capital of Beedom"

Half-a-hundred trains—freight, express, and mail—besides boats and motor-trucks, at the beeman's service every day.

Full stocks, best goods, service and treatment. Get catalog.

MOORE & PEIRCE,
ZANESVILLE, OHIO, 22½ S. Third St.

ALWAYS ON TOP

Established 1885.
Write us for catalog.

BEEKEEPERS' SUPPLIES

The Kind You Want and the Kind That Bees Need

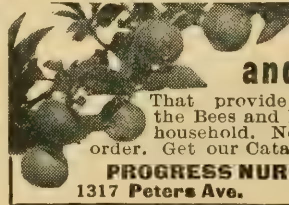
We have a good assortment in stock of bee supplies that are mostly needed in every apiary. The A. I. Root Co.'s brand. Let us hear from you; information given to all inquiries. Beeswax wanted for supplies or cash.

John Nebel & Son Supply Co.
High Hill, Montgomery Co., Mo.

3 BIG BARGAINS

WAIT! Before you buy an Engine, Separator, Spreader or any other machine, get Galloway's new low price; save ¼ to ½. 300,000 pleased customers testify to faultless designs, best materials. Satisfaction guaranteed. Send for catalog.

WM. GALLOWAY CO., Box 767
Waterloo, Iowa



Shrubs and Trees

That provide Nectar for the Bees and Fruit for the household. No Cash with order. Get our Catalog TODAY.

PROGRESS NURSERIES
1317 Peters Ave. Troy, Ohio

Books and Bulletins

"Every Step in Beekeeping," by Benjamin Wallace Douglass, published by The Bobbs-Merrill Co., Indianapolis, a delightfully written book of 178 pages, has just been issued. The book is written especially for beginners in beekeeping, the author drawing largely from his own experience as a beginner, enumerating the many perplexing problems which he encountered and telling how they were solved. The book is exceedingly entertaining, aside from the lessons in beekeeping, tempting the reader on from chapter to chapter like a novel. It is well illustrated with a number of half-tone plates, making it an attractive volume.

The Interim Report of the Dominion Apiarist, by the late F. W. L. Sladen, is a valuable bulletin published by the Department of Agriculture of the Dominion of Canada. This bulletin gives a summary of results of experiments conducted by the Bee Division of the Dominion Department of Agriculture, on the prevention of swarming, size of hives, wintering two queens in a hive, outdoor wintering, and cellar wintering.

Buy Your Bee Supplies Now

Take advantage of early-order discounts by ordering NOW. We guarantee to please you. "Prompt service and the very best" is our motto. *We want your beeswax and old comb.* Highest cash and trade prices offered. Texas beekeepers should writer A. M. HUNT, Goldthwaite, Texas.

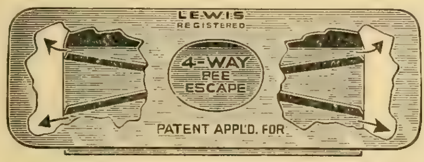
Manufactured by

Leahy Manufacturing Company

95 Sixth St., Higginsville, Missouri

Write for FREE catalog. It is your interest.

LEWIS 4-WAY BEE ESCAPES



Four exits from supers. Fits all standard boards. Springs of coppered steel. Made of substantial metal. Price each 20c postpaid. Made by

G. B. Lewis Company, Watertown, Wis., U.S.A.

Sold only by Lewis "Beeware" Distributors.

We Are the HUB for HUBAM

Guaranteed, certified Annual Sweet Clover.

All new crop, grown on our own farms and all from the first fifty seeds from that original plant at Ames.

We are shipping to all parts of the world now. HUBAM is being planted somewhere every day for bee pasture, hay, pasture, or for green manure to plow in.

The seed is hulled and scarified, with a purity of 99.8% and grows 97%. Price now is $2.00 per pound.

Our seed is pure. You buy from an old established firm with a reputation to maintain when you buy from

The Henry Field Seed Co.
SHENANDOAH, IOWA.

Completely Destroys the Weed Growth

More than that, the BARKER breaks the hardest crust into a level, porous, moisture-retaining mulch — **all in the same operation.**

A ten-year-old boy can run it—do more and better work than ten men with hoes. Saves time and labor, the two big expense items.

BARKER WEEDER, MULCHER AND CULTIVATOR

Eight reel blades revolve against a stationary underground knife—like a lawn mower. **BEST WEED KILLER EVER USED.** Works right up to plants. Cuts runners. Aerates the soil. Has leaf guards, and shovels, for deeper cultivation—3 *garden tools in* 1.

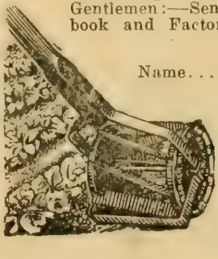
FREE ILLUSTRATED BOOK.

Tells how gardeners and fruit-growers everywhere are reducing their work; increasing their yields.—How to bring growing plants through a dry season.—How to conserve the moisture and force a larger, more rapid growth. Send TODAY for this free, illustrated book and special Factory-to-User offer.

BARKER MANUFACTURING CO.

Dept. 23. David City, Neb.

Barker Mfg. Co., Dept. 23, David City, Neb.
Gentlemen:—Send me postpaid your free book and Factory-to-User offer.



Name. . . . .

Town. . . . .

State. . . . .

R. F. D. or Box. . . . .

Bees & Queens for 1922

Is there a great difference among bees and queens? Mr. Beekeeper, with bees and queens a small difference counts high. A small per cent better laying queen will greatly increase the field force; this will insure a larger honey yield per colony. A small per cent better worker will aid wonderfully. A small per cent more gentleness will greatly reduce the stings; this increases the efficiency and speed of handling, not counting the pleasure. A small per cent of better marking adds wonderfully to the beauty of the colony. By developing the small qualities of my bees and queens I have attained marked success in producing better queens and bees. My aim is to produce bees and queens that will meet the high standard required by beekeepers. Let me book your order for 1922. One-fourth the full amount will insure your getting bees and queens when you want them most next spring. Perfect satisfaction, safe delivery, and pure mating guaranteed. Pure Italian bees and Three-Band Italian queens of the better kind.

Untested—1, $1.50; 6, $7.50; 12, $13.50. Selected Untested—1, $1.75; 6, $9.00; 12, $16.50. Tested—1, $2.50; 6, $13.00; 12, $24.50. Selected Tested—1, $4.00; 6, $22.00; 12, $41.50. One pound bees, $2.75; two pounds bees, $4.75; three pounds bees, $6.75. If queen is wanted with bees add price. Write for prices on large lots.

N. FOREHAND, RAMER, ALABAMA

Try Achord's Package Bees and Queens

THREE-BANDED ITALIANS ONLY.

We have the stock, equipment, and experience, and can give you prompt, satisfactory service. We have more than 1000 big, healthy hustling colonies of pure Italian bees to draw from. Write for illustrated price list.

W. D. ACHORD, FITZPATRICK, ALABAMA

SPECIAL OFFER
ITALIAN BEES AND QUEENS

Having decided to make a specialty of three-frame nuclei with queens we are offering these at prices that will pay you to inquire for. We have 2000 colonies of **ITALIAN BEES** headed with young queens **ABSOLUTELY FREE OF DISEASE** to draw from. We are prepared to give your order prompt attention whether it is for one or a thousand nuclei. If customer or community wants as many as a carload, we are prepared to ship that way.

Will start shipping April 15th and can ship 200 packages a day. We will let nothing within our control come between us and your order for bees and queens. We **GUARANTEE SAFE ARRIVAL AND SATISFACTION**, and to ship your order within five days of the day set or wire you when we can ship giving you the privilege to cancel your order.

Let us quote you; we can save you money.

THE STOVER APIARIES
MAYHEW, MISSISSIPPI

Package Bees and Reliable Queens

GOLDEN AND THREE-BANDED ITALIANS

We are now in a position to accept orders for queens and bees for 1922 shipping, in large quantities.

We have the stock and the equipment and experience necessary to handle your orders, whether large or small, and promptly and in a satisfactory manner. All packages are headed with large vigorous young queens of our own production. You will be pleased with the stock and service we can give you. Write for our price list.

E. A. SIMMONS
GREENVILLE, ALA.

1922 PRICES

PACKAGE BEES with select three-banded Italian queens delivered to your address via parcel post, postage paid by me. Prices:

1-pound package with young Italian queen	$4.50
2-pound package with young Italian queen	6.00
3-pound package with young Italian queen	7.50

25 cents per package less for twelve or more packages.

The high quality of my queens, combined with prompt service and reliability, justifies the above prices. Let me book your order now with 10 per cent cash, balance just before shipping. Will send bees on the day you name. Pure mating of queens, safe arrival, and satisfaction guaranteed.

JASPER KNIGHT
HAYNEVILLE, ALA.

5 REASONS WHY---

You will want to send us the coupon at once

Money Saved Is Money Made

The A. I. Root Co. of Iowa,
Council Bluffs, Iowa.

Gentlemen:—Kindly name your fall prices of the following:

1. Eight-frame hives, metal covers, complete, sets 5 KD.
2. Eight-frame bodies, with frames, complete, sets 5 KD.
3. Shipping cases, lots of......
4. Cans, jars, pails, and second-hand 5-gal. cans.
5. Honey tanks.

Name ....

Address ....

City ....

State ....

THE A. I. ROOT CO. OF IOWA
COUNCIL BLUFFS, IOWA

New Prices on Friction-Top Pails

	25	50	100	200	500	1000
2½-lb. Cans	$1.50	$2.25	$4.10	$8.00	$19.00	$37.50
5 -lb. Pails	2.10	3.80	7.25	14.25	33.50	65.50
10 -lb. Pails	2.75	5.15	9.85	19.50	47.00	93.00

5-lb. Pails in reshipping cases of 12	$1.30;	ten cases $12.00
10-lb. Pails in reshipping cases of 6	1.00;	ten cases 9.00
1-lb. Round jars, 24 to case, per case	1.70;	ten cases 16.50
½-lb. Round jars, 24 to case, per case	1.50;	ten cases 14.00
6½-oz. Tumblers, 48 to case, per case	1.65;	ten cases 16.00

These prices are f. o. b. cars Lansing and not from some distant shipping point.

Paste for Tin and Glass Packages

We have a very excellent paste for fastening labels on your glassware or pails. THEY STICK. We are quoting prices below. Postage extra.

"A" grade paste, per pint	$ .30
"A" grade paste, per quart	.55
"A" grade paste, per gallon	2.00

4% Cash Discount for December Orders

This discount applies to goods wanted for next season, and does not apply to orders for containers listed above.

BUY NOW the goods you need for next spring. Take advantage of the discount, and get your goods ready for use during the winter months. Quantity discount allowed on large orders. We can quote you the 1922 prices at once. Send us a list of the goods you need.

We Sell Root Quality Goods Only

BEESWAX WANTED—We want beeswax. Top market price paid, cash or trade for goods.

M. H. HUNT & SON
510 North Cedar Street, Lansing, Michigan

THREE-BANDED LEATHER-COLORED

20,000 Italian Queens for 1922
4,000 Packages and Nuclei

SOUTHLAND QUEENS

THEY EXCEL

Bred from Root Home-Bred Selected Breeders. Backed by over 50 years' experience in breeding the Best, Most PROLIFIC queens of today.

EXTREMELY PROLIFIC BRED FOR SERVICE

A FEW VOLUNTARY LETTERS.

New Liskeard, Ont., Canada.

Your queens are the largest, finest, most prolific I have ever handled. Have purchased queens from the largest breeders in the country and yours surpass them all. They are hardy, resistant. They eat up E. F. B. Am telling all my neighbors about your queens.

——————————.

Slater, Wyoming, Sept. 22, 1921.

Queens arrived O. K. Received Sept. 9th. A day and a half from the time the queen was turned loose there were FOUR frames filled with eggs. Thanking you for your good queen, I remain,

——————————.

Vancouver, B. C., Sept. 1, 1921.

We received the queens several days ago. I might say that while I have imported several hundred queens this year these are the best in the Leather-colored Italians that have been imported yet. The leather-colored bees are winning favor over the goldens in this province.

——————————.

20,000————QUEENS————20,000

Untested, $1.50; 12 or more, $1.25; 25 or more, $1.15; 50 or more, $1; 100 or more, 90c.
Tested, $2.50; 12 or more, $2.25; 25 or more, $2.15; 50 or more $2; 100 or more, $1.90.

POUND PACKAGES—SHIPPED ON COMB OF FOUNDATION

(F. O. B. Shipping Point by Express.)

1-lb. package, no queen, $3.00; 25 or more, $2.25; 50 or more, $2.15
2-lb. package, no queen, $5.00; 25 or more, $3.75; 50 or more, $3.50
3-lb. package, no queen, $7.00; 25 or more, $5.25; 50 or more, $5.00

NUCLEI

Good strong combs—filled with brood. Same prices respectively as pound packages.

**WE GUARANTEE SAFE ARRIVAL. MISMATED QUEENS REPLACED.
BOOK YOUR ORDER NOW. OUR SUPPLY IS LIMITED.**

THE SOUTHLAND APIARIES

BOX 585, HATTIESBURG, MISS.

WHILE I have again reared a crop of whiskers, *I have shaved my prices* on queens for the season of 1922 to conform to the general reduction in prices of other commodities, but the high quality will be maintained; in fact, I make it a rule to produce better queens every year by employing improved methods and always striving to improve the stock. I have proved to my own satisfaction that the stronger the colony that builds the cells, the larger, better and more uniform will be the queens thus reared. While it is more expensive to produce queens in this manner, as many colonies must be weakened to furnish brood to the cell builders, yet it pays us as it creates a steady demand for our queens at prices that are fair to all concerned. But it pays the purchaser still more, as he gets splendid queens that bring big returns in honey. The season just closed was very satisfactory in that we were able to fill most orders at the time promised, but still we had some more than we were able to fill. We are increasing our nuclei and will make an earnest effort to give prompt service the coming year; but I solicit the co-operation of our customers in this matter, and, in order to facilitate prompt shipment, we request that you anticipate your wants as far in advance as possible and place your order early. No cash is required in booking an order, but money may be sent any time before the day of shipment. However, as some will find it convenient to send cash with order, we allow a *discount of* 6% on all cash orders received during the month of December.

1922 PRICES

Before Aug. 1st.

1 to 4 inclusive	$2.50 each
5 to 9 inclusive	2.45 each
10 or more	2.40 each

After Aug. 1st.

1 to 4 inclusive	$2.00 each
5 to 9 inclusive	1.95 each
10 or more	1.90 each
Breeders, for the season	$10.00 each

A card will bring our catalog.

JAY SMITH, ROUTE THREE, VINCENNES, IND.

A Superior Quality at Less Cost

SUPPLIES

A Superior Quality at Less Cost

THE SPECIAL PRICES LISTED BELOW ARE GOOD UNTIL DEC. 31st.

These supplies are made by the Diamond Match Co., and are of a superior quality. Hives, Supers, etc., listed below, are in the flat, and are complete with Hoffman frames, metal rabbets, and all inside fixtures.

One-Story Dovetailed Hives

Five 8-frame	$10.50
Five 10-frame	11.00

Full-Depth Supers

Five 8-frame	$5.00
Five 10-frame	5.50

Shallow Extracting Supers

Five 8-frame	$4.00
Five 10-frame	4.50

No. 1 Style Comb Honey Supers

Five 8-frame	$3.50
Five 10-frame	4.00

Standard Hoffman Frames

100	$5.50
500	25.00

Aluminum Honeycombs as now made by Duffy-Diehl Co., are meeting with success. We carry these in stock to supply Eastern beekeepers.

HONEY! HONEY! HONEY!

Beekeepers who are supplying Honey to a regular family trade, or who are located along the highways, and are supplying motorists, know that their customers want a honey of a uniform color and flavor. And unless the honey is at all times uniform in color and flavor, customers sometimes become dissatisfied. Our special blend of Fancy Honeys (liquid) is always uniform and is of a fine mild flavor, and will satisfy the most exacting trade.

Special Blend of Fancy Honey (Liquid)

10-lb. Tins, 6 per case	16c lb.
5-lb. Tins, 12 per case	17c lb.
2½-lb. Tins, 24 per case	18c lb.
Pure Vermont Maple Sap Syrup, case of 12 5-lb. tins	$14.00

Various Grades, Crystallized, 60-lb. Tins

Water White Orange	14c lb.
Water White Clover or White Sage	13c lb.
Extra Light Amber Sage	11c lb.
N. Y. State Buckwheat	10c lb.

GLASS AND TIN HONEY CONTAINERS

2½-lb. Cans, 2 dozen reshipping cases, $1.45 case; crates of 100	$ 5.00
5-lb. Pails (with handles), 1 doz. reshipping cases, $1.35 per case; crates of 100	7.75
10-lb. Pails (with handles), ½ doz. reshipping cases, $1.10 case; crates of 50	5.75
60-lb. Tins, 2 per case—NEW, $1.30 case; USED	.25

White Flint Glass, With Gold Lacquered Wax Lined Caps.

8-ounce Honey Capacity, Cylinder Style	$1.50 per carton of 3 dozen
16-ounce Honey Capacity, Table Jar Service	$1.40 per carton of 2 dozen
Quart or 3-pound Honey Capacity, Mason Style	$1.00 per carton of 1 dozen

HOFFMAN & HAUCK, INC.

WOODHAVEN, NEW YORK

THE YOUTH'S COMPANION
TRADE-MARK
REG. U.S. PAT. OFF.

Christmas 52 Times a Year

THE YOUTH'S COMPANION

The Companion breathes the Christmas spirit all through the year. It helps to make home a centre of attraction ; it increases knowledge, holds fast to the highest standards of thought and conduct and provides wholesome entertainment in overflowing measure.

Our Christmas Present Offer

Every New Subscriber sending $2.50 with this coupon or the name of this publication will receive :

1 The 52 Weekly Issues of The Companion for 1922 2 All the remaining issues of 1921 3 The Companion Home Calendar for 1922 GLO	All for $2.50

THE YOUTH'S COMPANION, BOSTON, MASSACHUSETTS

This is the First of a series of advertisements which will appear from month to month featuring "Root Quality" products which are the results of revolutionary developments in manufacturing supplies and equipment for beekepers and honey-producers.

On this page next month will be given a brief sketch of the early history and development of the honey extractor from the first crude machine down to the latest modern product of engineering skill and mechanical design.

AIRCO

The Comb Foundation With a Perfect Cell Base.

After years of experimenting and at an expense of thousands of dollars, the new Airco process of manufacturing comb foundation was perfected. That this time and expense was justified is amply demonstrated by the numberless testimonials received from all parts of the world. Airco foundation has marked a new era in beekeeping.

The superiorities of Airco over the old-style foundation made upon cut mills are two-fold:

1. The new milling process makes possible a base with a natural comb angle; a base with no distortion; a foundation with no imperfect cells; and a foundation with reinforced and braced cell walls.
2. The new refining process insures denser and tougher wax, cleaner wax, more ductile wax, and wax that stays fresh much longer.

ASK THE BEES — They know what they want and why they want it.

Send for our free booklet, "Why Bees Prefer Airco Comb Foundation."

Order early and save delay. 4 per cent early order cash discount for December.

"There is a Root Dealer Near You."

THE A. I. ROOT COMPANY, MEDINA, OHIO

Fifty-two Years in the Bee Supply Industry.

New York, 23 Leonard St.
Philadelphia, 8-10 Vine St.
Chicago, 224 W. Huron St.
Indianapolis, 873 Mass. Ave.
St. Paul, Minn., 290 E. 6th St.
Norfolk, Va., 10 Commerce St.
New Orleans, La., 224 Poydras St.
Syracuse, N. Y., 1631 W. Genesee St.
Savannah, Ga., 126 W. Bay St.

(Watch this page in the January issue for the next installment.)

The American Bee Journal

C. P. DADANT—Editors—FRANK C. PELLETT
Assisted by contributors foremost in their fields.

SUBJECTS RECEIVING SPECIAL ATTENTION ARE:

There is no bee paper in the whole world to be compared for size and general excellence to the American Bee Journal.—Rev. A. A. Evans, London (England) Herald.

Factors controlling nectar secretion.
Articles on practical beekeeping.
Nectar sources of different states.
The cost of production.
Questions answered by C. P. Dadant.
Crop and market reports monthly.
General and association news.
Travel and observation notes.

You are publishing by far the best bee Journal I have ever seen.
—V. R. Thagard,
Greenville,
Alabama.

RECENTLY INCREASED IN SIZE FROM 32 TO 44 LARGE SIZE PAGES.
Subscription price, $1.50 a year. Foreign postage, 25 cents.
Sample copy mailed gladly on request.

OUR BEE BOOKS

THE HONEYBEE, Langstroth and Dadant, 575 pp., 212 engravings, cloth bound. Price postpaid $2.50. French edition $2.50. Spanish edition $2.50.

FIRST LESSONS IN BEEKEEPING, C. P. Dadant, 167 pages, 178 illustrations, cloth. Postpaid $1.00.

1000 ANSWERS TO BEEKEEPING QUESTIONS, C. C. Miller, Cloth, 200 pages, illustrated. Price postpaid $1.25.

PRACTICAL QUEEN REARING, Frank C. Pellett, 105 pages, 40 illustrations. Cloth. Postpaid $1.00.

OUT-APIARIES, M. G. Dadant, 115 pages. Cloth, 50 illustrations. Price postpaid $1.00.

AMERICAN HONEY PLANTS, Frank C. Pellett. 300 pages, 155 illustrations. Cloth. Postpaid $2.50.

DADANT SYSTEM OF BEEKEEPING, C. P. Dadant. 115 pages, 58 illustrations. Cloth. Postpaid $1.00.

BEEKEEPING IN THE SOUTH, Kennith Hawkins. 125 pages. Cloth, 50 illustrations Price postpaid $1.25.

Add $1.25 to the price of any book for both book and American Bee Journal one year.

American Bee Journal, Hamilton, Illinois